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Philosophy in the surgery? Law and medical ethics

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Eight-page BTEC supplement



HIGHER EDUCATION SUPPLEMENT
Priory House, St John's Lane, London EC1M 4BX. Telephone 01-253 3000

Keeping an open mind

The trouble with polyversities is that everyone - well, nearly everyone - agrees that they are a good thing, but almost no one wants to be first in line. The merger of the New University of Ulster and the Ulster Polytechnic in Northern Ireland was the first object of attention, but most people argued that special conditions in the province made it an unlikely precedent. The Government seemed to agree: ministers did not object to an expensive topping-up of superannuation benefits for the polytechnic's staff and to including a copper-bottomed tenure clause in the new university's charter.

Then the focus of attention moved to Scotland with the proposal first to amalgamate Aberdeen University, Robert Gordon's Institute of Technology, and Aberdeen College of Education and more recently (and more speculatively?) to merge Stirling University and Paisley College of Technology. The Aberdeen plan seems to have run into the ground for reasons that remain obscure but certainly include etiquette problems (the two colleges felt the whole plan was sprung on them by the university principal) and the administrative difficulties which seem to grip the Scottish Education Department (the SED has been promising for months to announce its decision on the proposal to establish a very preliminary committee of inquiry). The Stirling-Paisley merger looks an unlikely prospect with 40 miles between them and two universities and the city of Glasgow in the way.

So now the attention has settled on London where the Inner London Education Authority is about to propose formally that the City of London Polytechnic and the City University should be amalgamated. Before any one jumps to the conclusion that this polyversity proposal too will run into the sand, especially as it is being made by an authority controlled by the bitter political opponents of the present Government and scheduled for administrative castration as part of Mrs Thatcher's war on the metropolitan county councils, they should think again. It is clear that the ILEA is in deep cahoots with the Department of Education and Science, the University Grants Committee, and the National Advisory Body on the issue of the two City mergers. Although this issue is far from being settled, as the Ulster merger was settled by political force majeure, it is a far more likely prospect than either of the proposed Scottish mergers. It is not idle talk.

On balance that is beneficial, to both the supporters and the opponents of polyversities. It is a time that the idea was subjected to some tests of principle and practice. For if the principles and the details of university-polytechnic amalgamations are properly discussed, the whole idea will

remain an object of obscure desire or fear depending on one's existing prejudices. So it would be to everyone's advantage to pursue the ILEA's proposal much further down the road towards implementation before either endorsing or rejecting the polyversity idea.

In any case London is the logical place for a polyversity experiment because it contains a high, but also diverse, concentration of higher education that is unparalleled elsewhere in Britain. The federal University of London with its many schools and institutes is itself in the middle of wholesale rationalization. The ILEA which is responsible for five polytechnics and a large number of art and other colleges engaged in higher education is just completing the first stage of its review of advanced further education.

But there are also important supporting actors on the London stage: Brunel and City on the east, East London Polytechnic, Ealing College of Higher Education, Roehampton Institute of Higher Education on the non-university side. Poised uneasily (and untenably?) in the middle is Goldsmiths.

There is also a *prima facie* case for arguing that if a start must be made somewhere a merger between the two City is perhaps the best place. City chose to stay outside London University status in the mid 1960s and so is outside the scope of London's present rationalization initiative. The ILEA is determined to reorganize its five polytechnics into more sensible institutions.

The academic fit between the two City is also fairly good. City University is strong in engineering (although not as strong as it should be, some might say) and has a very good business school that concentrates on postgraduate and post-experience management courses; it is weak in social sciences. The City of London Polytechnic is strong in these two latter areas. The leaderships of the two institutions are evenly matched, which in the event of a merger would prevent the damaging impression of a takeover.

But although the first prospects for the merger look modestly good the ground rules have to be established. It is fair to say that any polyversity would be a chartered university on the Ulster model with university pay scales, superannuation, staffing standards, and tenure (or not as the case may be). The ILEA is not arguing this point. As the Inner London Polytechnics already enjoy corporate status this is a less important issue than it might be elsewhere.

But this still leaves a range of tricky issues. First comes the spread of

courses to be offered in the new polyversity. The ILEA is particularly committed to opening up access and to protecting part-time and sub-degree courses, and so would be especially unhappy at signs of incipient "academic drift." In fact this may be less of a problem than in the past: the demographic pressures which throughout the 1960s and 1970s encouraged concentration on full-time degree-level courses may in future encourage institutions to pay more attention to less traditional courses.

Second is validation. Should a polyversity award its own degrees without external supervision? Should some courses remain validated by the Council for National Academic Awards and other agencies? Or should there be a move towards a homogeneous regime of self-validation, monitored at intervals by the CNA (with the help possibly of the UGC)? Third is control. The ILEA would have to give up its detailed administrative supervision once the polyversity became a chartered institution, but would clearly insist on maintaining a substantial stake in the direction of the new university. Generous representation on the university's court might not be enough. So perhaps the conventions of university government would need to be reworked.

Fourth and most sensitive of all is finance. How should a polyversity be funded - by the UGC? By some ugly consortium of UGC, NAB, and ILEA? By the ILEA on the formal advice of the UGC? Or the other way round? Or any way round? The range and complexity of options are very considerable. Again it might be necessary to go back to first principles, rather than to cobble together bits and pieces of two separate funding systems designed on very different premises. The preconditions however are clear enough: the polyversity would need to be funded in a way that was not materially inferior to that enjoyed by traditional universities, but its closer links with local authority education would have to be entrenched in any funding system.

But it is important not to run too far ahead, its important to heed the possibilities of university-polytechnic mergers or overhauling the obvious difficulties. At present the need is for everyone to keep an open mind. The ILEA and the two City should start negotiations in a positive spirit in the hope and belief that if successful an exciting new type of institution could be born. In the meantime the DES, the UGC, and the NAB should show supportive, but not oppressive, interest in these negotiations. The issues are too fundamental and too complex to be ignored in the pursuit of short-term gains from painful arm twisting.

White elephants

The annual public expenditure White Paper is becoming less and less useful as a guide to future Government intentions. What began in the late 1960s and established itself in the 1970s as a sophisticated exercise in planning public expenditure, and so provided an invaluable forward look at Government priorities, has degenerated in the 1980s into a superficial holding operation in which present programmes are rolled forward into the future. The public expenditure survey, which was designed to be the budget's better half, is now only good for a day or two of managed headlines.

The rot started with the move to cash limits. At the time this was seen as a way of tightening up public expenditure planning, and making it conform more closely to the eventual outcome. But expressing spending plans in terms of volume did have the advantage of placing proper emphasis on the actual services which were being provided. So shifting Government priorities could be charged. Today's surveys put

all the emphasis on cash, which not only makes it difficult to sort out the winners from the losers but makes it even more difficult to plan at all. It is even doubtful whether projected expenditure and actual expenditure have been brought any closer together. The result is that last year's White Paper tells us very little about the Government's medium-term intentions for higher education. The blueprint for universities is sloping funding, no more dramatic cuts but continuing pressure on the unit of resource. For the polytechnics and colleges after a dip in 1984/85 there seems to be a modest recovery. The science budget appears to benefit from genuine level funding. But in practice this broad picture tells us very little.

Over the last three years all the action in university funding has been to do with various special programmes - restructuring, new blood, information technology. None of these were more than a glimmer in the eye of Sir Edward Parkes when the public ex-

penditure White Paper which set the recurrent grants was published in early 1981. Over the next three years a key issue for the universities will be whether the Government finds extra money for an extension of the new blood programme. An informed guess is that it will. But there are no clues in the White Paper. To a substantial degree the decisive games in higher education policy remain to be played. Some may argue that the increasingly unsophisticated nature of the public expenditure surveys of the 1980s allow enterprising ministers a discreet but crucial room for manoeuvre. In the short run that may be true. But it is probably more important that Whitehall should be able to plan public expenditure in a coherent and positive way. At present the Department of Education and Science is in the unhappy position of urging higher education to engage in a series of "great debates" about the future while the greater Whitehall debate that its priorities is becoming weaker year by year.

Laurie Taylor



Tuesdays would certainly be very difficult. I have an Interdepartmental Teaching Workshop Committee meeting every other week for the rest of the term, and as I'm also on the Information Technology Sub-Committee of that group.

I'm so sorry, Doctor Ellison, I missed the first part of that. Did you say Tuesday was Teaching Workshops?

Yes, Registrar. Well, I think we'll be alright then. Honorary Degrees Committee is always Thursdays - yes, that's right, my secretary's nodding at me - and of course during spring term only.

In that case, it sounds as though it should be possible. Good, good. Now, may I move on. We'd also be very pleased if you would join us on Promotions Committee as from October. Professor Nossiter, who is deputy chairman of that committee, personally expressed his belief that you would have something positive to contribute in that setting. And as you know it's one of the more important university committees. Only open to senior staff.

That's very kind of Professor Nossiter. Excellent. And while I'm sorting out these matters, Doctor Ellison, it would also make good sense, now that you're on Finance Committee, if you joined us on Estates and Gardens. That's usually Wednesdays, and of course there's quite a bit of overlap with Finance. Indeed you'll find some of the background papers identical.

Anything which reduces the preparation time would certainly be a blessing. Jolly good. So unless there's anything else, Doctor Ellison, I'll make the appropriate adjustments, and you'll duly receive papers and agenda through the internal mail.

Well, actually, Registrar, there is just one other thing. Yes?

You see, I really don't mind being invited to join another three university committees in addition to the six upon which I already serve. Neither do I really mind the fact that the real reason for such invitations is that this university is trying to implement its AUT-infinite policy of ensuring adequate female representation on all committees. And neither do I really mind that this involves every woman academic on this campus in a quite disproportionate amount of work precisely because of the recruiting and promoting policies followed by the university in the past. And, at a more concrete level, I don't really mind greatly, if when I'm at these committees, every person present smiles indulgently in my direction whenever the word "woman" or "female" occurs in the discussion. I don't mind doors being opened for me, chairs being pulled back for me to sit down, even biscuits passed all round the table so that I may choose first. But, yes, there is ONE thing. Please, Doctor Ellison.

I will never attend any further meetings of any committee, at which the chairman, after I've been endeavouring to enter the discussion for 20 minutes, finally turns to me, and with a little flutter of his right hand, utters the phrase: "Let's hear from the ladies". IS THAT QUITE CLEAR?

© TIMES NEWSPAPERS LIMITED 1984
Printed by Times Newspapers Ltd., P.O. Box 7, 201, Victoria Road, London WC1X 9ZZ, England.
Typeset by the Times, 11, Abchurch Lane, London EC4N 3DF, and printed by Northampton Newspapers, 100, High Street, Northampton NN1 2BN.
Distributed by the Post Office, ISSN 0950-0804.

The Times Higher Education Supplement

March 2, 1984 No 591 Price 60p

Thatcher sets new task for universities

by David Jobbins

The Prime Minister is determined to drag the universities firmly into the closing decades of the twentieth century.

And at Warwick University last week Mrs Thatcher added a third role to the universities' traditional tasks of teaching and research.

"It is that of turning discovery and creative ideas to the advantage of the population as a whole," she said. "It is very much a part of the role of universities not only to create those ideas, but to be a very part of the process which means those ideas are taken up outside whether in the arts or in the sciences, to the great advantage of all our people."

Opening an incubator building for small high-technology companies on Warwick's science park, Mrs Thatcher said that many people were too conservative and tended to cling to yesterday's industries and yesterday's courses.

"I find myself trying to force the pace of change just a little bit faster... I regard this university as being in the forefront of harnessing change to the well-being of society."

Mrs Thatcher reacted with good humour to the hostile reception from students and other demonstrators at Warwick. The authorities at Warwick, and at Essex where former Cabinet colleague Mr Cecil Parkinson was prevented from addressing a closed Conservative meeting, blamed outsiders for the trouble.

Both incidents happened as the National Union Students began its campaign for a new deal. The influence of Number 10 can also be detected behind the drive by the Department of Education and Science to weaken tenure and the importance attached to making the efficiency inquiry effective.

More evidence of the influence of Government emerged this week when the idea of an academic to head the vice chancellors' efficiency inquiry was ruled out. But former civil servants have also been eliminated and the independent chairman of the steering committee, likely to be announced shortly, is to be a businessman with academic links.

Mr Brian Taylor, secretary general of the Committee of Vice Chancellors and Principals, said a large number of universities were putting themselves forward to take part in the study.



Reception committee... some of the protesters who greeted Mrs Thatcher at Warwick

Funding gap puts strain on NAB/UGC relations

by John O'Leary

The first serious signs of strain between the University Grants Committee and the National Advisory Body emerged this week as the two agencies cleared the decks for their "great debates".

At the latest meeting of the NAB board there was concern that last month's public expenditure White Paper would lead to a widening of the gap in funding between the universities and the public sector. Some members advocated a direct protest on the issue to Sir Keith Joseph, Secretary of State for Education and Science.

Although Mr Christopher Ball, chairman of the NAB board, headed off such an approach on the grounds that it would be beyond the body's terms of reference, it was agreed that doubts should be expressed about the adequacy of likely future budgets. The 12-member "chairman's study group" is to consider whether to recommend an appeal to Sir Keith and will monitor comparisons with the universities.

Papers by the NAB secretariat put the likely size of the advanced further education pool at £597m in 1983/84 and about £615m in 1986/87, compared with £580m next year. They calculate that yearly increases in pay and prices of more than 2 per cent would imply further reductions in funding levels. "This is almost certain to be the case, the secretariat warns. Student numbers are expected to rise by almost one per cent in 1985-86."

Dr Ray Rickett, director of Middlesex Polytechnic, described the White Paper's effect on higher education as "educational apartheid". He said it would lead to a widening of the gap across the binary line and a lowering of standards to produce second class citizens in the public

sector. The universities had been largely protected from inflation while the polytechnics would suffer a further cut of perhaps 8 per cent over three years.

Some members of the board who previously accepted lower funding levels as a necessary consequence of maintaining access for students supported Dr Rickett in calling for a halt now. But Mr Ball argued against busing the case on equity of treatment with the universities.

"You could take the view, as I might, that while the teaching staff are overpaid, the other areas of funding, such as support staff and support costs, are underprovided," he said. "But it is only a suspicion and we are going to commission work on these areas and develop a firm view of what is needed."

He is to return the theme today in a speech at the annual meeting of the Association of Colleges in Further and Higher Education, arguing that adequacy and not equity is the test of funding. The NAB, he will say, must insist unequivocally on adequate funding, but the public sector should not regret having a lower unit of resource than the universities.

A second area of embryonic disagreement between the UGC and the NAB is about their mutual relationship. Two meetings have been scheduled between the "chairman's study group" and a half-strength UGC to coordinate as far as possible their views on matters of common interest in their "great debates".

However the UGC sees these meetings as merely a useful exchange of views, such as it has on a semi-regular basis with the vice chancellors' committee. The NAB on the other hand believes that the two bodies should enjoy a much closer special relationship.



Writing the history of science, 14

Cash agreed for Europe's new venture

by Jon Turney

Science Correspondent
The Common Market Information technology research programme ESPRIT, held on the starting blocks by British and German governments over the budget, was finally approved by all the member governments this week.

Research ministers put the final seal on the £800m five-year programme in Brussels on Tuesday. Half the cost will come from the EEC budget and half from industrial contributions to ESPRIT research contracts.

Britain's ascent, given by Mr Kenneth Baker, minister for information technology, follows talks last week between the European commissioner for research, Vicomte Etienne Davignon, and Mrs Margaret Thatcher, the Prime Minister.

Mrs Thatcher agreed to back the plans, in spite of Britain and Germany's earlier stance that approval must await resolution of the community's wider budget problems. A similar trip made by Vicomte Davignon to put the case for ESPRIT to German ministers produced the same positive result.

The go-ahead for ESPRIT, which is designed to back strategic research for the European information technology industry, will help allay fears that the programme would start too late to keep up with national research programmes in Japan, the United States and Britain.

The directors of the British Alvey programme for advanced computer research are keen to dovetail their efforts with the wider European plans. And the European collaborative work is seen as crucial for establishment of common standards for the next generation of computers and telecommunications equipment.

Adult agency falls short of expectations

by Maggie Richards

Proposals for a successor to the Advisory Council for Adult and Continuing Education are to be put forward later this month, but they are understood to fall far short of the development agency that adult educators had hoped for.

Recommendations for the creation of a small unit are to be put to the council of the National Institute of Adult Continuing Education. The unit will have a £50,000 budget to cover administrative expenses but it will rely on the Department of Education and Science for project funding.

The unit's function will be to build on the many recommendations of the advisory council. It will have the task of drawing up plans for research projects to further develop the council's proposals.

A steering committee comprising DES officials, representatives of local education authorities and the NIACE will consider funding the unit's proposals.

But the unit is a far cry from the development agency envisaged by the advisory council in its Policies and Priorities document, which took three years to complete, and outlined strategies for adult and continuing education at all levels.

Dr Richard Hoggart, chairman of the advisory council, said: "I am not surprised, but it is a great deal less than what is actually needed. I am not persuaded by the Secretary of State's arguments about the economics of a development agency."

"I am not convinced this Government takes the case for continuing education seriously."

DON'S DIARY

SUNDAY

Maybe this week things will get back to normal. Whatever that is, I've been waiting, my whole life, for things to get back to normal.

Here, in Hawaii, it's a specially futile hope. There is no norm. Only a puzzled mix of *haoles* (whites), Japanese (the largest group), Chinese, Vietnamese, Koreans, Filipinos, Polynesians (the most depressed group), others, and every combination of these. And tourists from the West (east) and the East (west). And the military.

In my other American jobs I've been self-conscious in class at first about my English accent. I've felt weird. Not here, where there are at least a dozen different accents in any classroom. Everyone is weird.

I decide to drive downtown to practise a temperamental borrowed van in the peace of Sunday morning. But Honolulu starts early, because of the heat. At 8am everyone is already bustling to church or temple or bench or Chinese market.

It's a pretty picture. Hawaii is full of beautiful people. They adorn themselves with *leis* and the women wear *muu-muus* (long dresses encouraged by the missionaries, who disapproved of bare legs and grass skirts).

Back home I spent most of the day on the *lanai* (veranda) reading *Paradise Lost* and *Frankenstein*. For different classes, but they go well together. For the first time I notice that banyan trees (but a bookish version with a botanical error) grow in Milton's Paradise.

MONDAY

Up at six for my 7.30 class. At least it's a lovely walk through the sunrise down from the mountains with a view of the ocean. I cut through the grounds of St Francis High School. There's a statue of the saint outside. He is wearing a *lei*. Already, when I pass the library at 7.15, students are sitting cross-legged waiting for it to open.

My class is punctual, unperturbed by the early start, but totally silent. Well, *Paradise Lost* can't seem the most accessible text to Buddhists who speak pidgin. Our whole programme feels imperilled.

I make the most of the banyan trees. I explain some of the banyan Christian doctrines. They have never sounded more nonsensical. My voice echoes in my ears. But most of the students aren't Buddhists. Christianity is the major religion here, though the Christian students don't seem to know its tenets (but that's not peculiar to Hawaii).

The main problem is not their ignorance (though the rest of the world hardly exists for most of them) but their silence. I was warned not to interpret it as hostility. Connoisseurs can distinguish fine shades of silence: attentive, bored, sullen, affectionate, approving... But there's a tension.

We are teaching mainly oriental students by western methods. They've been brought up to be quiet, respect their elders, act in groups and not argue. They're more cooperative than their sexy counterparts on the mainland. But we ask for debate, individual viewpoints, participation.

When I finish teaching at 11.30, after vainly trying to impose democracy on my classes, I'm exhausted. Winter temperatures in the mid-80s don't help. A swim does. Home, via the library.

TUESDAY

I teach Monday, Wednesday, Friday, so I spend the morning on the *lanai* reading essays. In some ways they are worse, in some ways better than I expected. Almost everyone has problems writing English, because it's a second language or they speak pidgin. But some of the students who seemed totally withdrawn have produced very good work. It must have been thoughtful silence.

In the afternoon I attend a graduate Greek seminar, composed mostly of *haole* individualists, quite different from my undergraduate groups. Some of us go out to a Japanese restaurant. Eating out is one of the cross-cultural pleasures of Honolulu.

WEDNESDAY

Dawn. Another day prepares for heat and silence. But there's an angry drama when the pay cheques come. The strike lasted two days, mere sabre-rattling, to show that most of the faculty would come out. Instead of two days pay out of 30 being docked, weekends have not been counted as paid time, so the deduction is larger than expected and feelings run high.

The strike was ostensibly about salaries. I feel a wry sympathy: they earn more than English academics but less than their colleagues on the mainland and prices are much higher here. But the deeper grievance surfaces again today: a feeling that education is not much valued - or understood - in Hawaii.

You sense the racial tensions that are supposed not to exist in this paradisaic island. Most of the faculty are *haoles* from the mainland; most of the administration are Hawaiian Japanese who may, as students here, have resented *haole* professors. ("Pinky swines", says one of the graffiti in the car park.)

When I visited friends on the plet, late last week they looked sheepish but radiant. This week the mood is depressed. Perhaps a long strike has been made more likely.

THURSDAY

I type frantically at home all morning, as I'm giving a paper at our department colloquium in the afternoon. At four o'clock in a baking common room with jugs of wine no one seems sharply critical. And it's a kinder department than most. (Because they feel like exiles in the colonies?) As a reward I'm taken out afterwards to a Korean restaurant.

FRIDAY

Aloha Friday as the media call it and we're all ready for the weekend. I assume the silence is contented today with the thought of surfing and snorkelling.

I give a dinner party on the *lanai*. We have what I now think of as The Conversation, a comforting group therapy exchange of our teaching problems. "Tim's a regular Hawaiian cat," I remark of my plaintive tabby. "He has such a tiny voice. Sometimes he only opens his mouth and no sound comes out. Just like the students." "No," says a colleague. "They don't even open their mouths. He's more articulate."

SATURDAY

An English guest arrives, stopping off between lecturing in Japan and California. I take him sightseeing and am persuaded yet again about subliminal learning: after not driving for a week, I find I have mastered the road. I give a cocktail party for him. Most of the guests bring *pupus* (Hawaiian for hors d'oeuvres - when you can say it, you're integrated). We sip *Mai-Tais*. A warm evening, a wonderful sunset. A demi-paradise, perhaps.

Priscilla Martin

The author is visiting associate professor in the English department at the University of Hawaii at Manoa, Honolulu.

Glencarlo Piccarro (left), of "The official Acne party", and Chris Hill, of "The Prisoner: I am not a number party".

Two of the candidates in yesterday's byelection at Chatterfield. Mr Piccarro, 21, is a second year sociology and geography student at Worcester College of Higher Education, who had always wanted to stand in a byelection. "Acne was the silliest name for a party that I could think of that has anything to do with me," he said. Mr Hill, only 18 and could not take a seat in Parliament for three years. He starts at St. Andrews University later this year and will study physics. His campaign is based round his affection for the television series *The Prisoner*.



CNAA approves threatened engineering degrees

by Karen Gold

Two of four polytechnic engineering degrees threatened last year with loss of validation have been given new approval by the Council for National Academic Awards.

Three of the degrees at the Polytechnic of Central London - BSc in electrical and electronic engineering, and control and computer engineering, and an MSc in digital systems received last minute permission to recruit students last summer after an appeal to a special CNAA panel.

The BSc in mechanical engineering was given approval for only 12 months - the eventual fate of the other degrees.

Now the CNAA has given two year approval for a revised MS in digital systems, and if the polytechnic makes some small changes the electrical and electronic engineering degree will be

come one of the prestigious new BEngs.

PCL's new pro-rector Dr Peter Thompson, who has been put in direct control of the engineering faculty to satisfy the CNAA, said that he hoped there would be similar approval for the two other threatened degrees.

The polytechnic had changed the management structure in the engineering faculty to a much more traditional one in which everyone's responsibilities were clear, as well as taking direct control which would probably last for another two years. The CNAA's committee for institutions had visited the polytechnic and been sufficiently enthusiastic about the new structure to recommend council boards to approve the resubmitted degrees, although the committee had reserved judgment on how the system would work in practice.

Court bid to end protest

Students at an adult residential college in Wales were today awaiting the outcome of court action over their three-week occupation of administrative offices.

About 130 mature students at Coleg Harlech, have been involved in the protest at the Government's decision to revise arrangements for the payment of their grants.

As the college authorities were taking court action in London today to evict them, the students were hoping for a good response to their call for a demonstration outside the law court.

Through the Mature Students' Union, the protesters have also asked students at other adult residential colleges in England and Wales to stage 24-hour sympathy occupations.

"Scotland is not affected by the action: as the new grant regulations do not apply.

The students at Coleg Harlech are angry that they, and their counterparts at other adult residential colleges, are not now covered by normal grant regulations. Instead the Government has insisted that their grant payments should be made directly to colleges, which will deduct appropriate, but unspecified, amounts to cover accommodation costs.

Backing for the students came from the Mature Students' Union at its annual conference in Loughborough last weekend. The union, which is affiliated to the National Union of Students, decided to launch a publicity drive to attract new members. It is also to seek a permanent office.

Ealing decision worry

by David Jobbins

Local authority employers' confidence in a national negotiating body for lecturers' conditions of service has been badly dented by a court decision implying that many of them may be obliged to give one year's notice of redundancy.

They believe that last year's judgment against Ealing Council was that the power of the national joint council to make model agreements, which fall short of binding national agreements has been eroded.

A number of proposals for discussion at last week's meeting of the NEC have been shelved while officials consider whether to take legal advice on whether all decisions reached with the unions are binding on authorities.

And authorities have been advised by the Local Authorities Conditions Service Advisory Board that in the meantime they should not regard themselves as bound by the judgment and should continue to operate established policies.

Senior officials recognize that the advice may well lead to further litigation - and there were suggestions that this would be a welcome development which might enable the judgment to be reversed.

Last year the High Court ruled that Ealing should have given one year's notice of redundancy because it had agreed to incorporate national agreements into individual contracts of employment, which are legally binding. The judge said he regarded the redundancy agreement reached in the NEC - essentially establishing the status quo pending further negotiations - as a full agreement and not, as employers believe, as a recommendation.

Ealing did not appeal against the court's decision and it is now out of time for other bodies to take the case to appeal.

One victim of the decision to strike all proposed model agreements unless they became binding on all authorities was a proposed scheme for discipline and suspension procedures.

Officials feel that national agreements cannot be binding in law as the Ealing judgment falls outside the mainstream of practice across the entire public sector. The employers have tended to press for model agreements which are available for adoption locally, while the unions have preferred national collective agreements.

Call for more flexibility

Declining numbers of school leavers may lead to an increased participation rate in higher education, although not enough on its own to sustain a student population of the present size, a London conference will be told today.

Mr Oliver Fulton, lecturer in the Institute for Research and Development in Post-Compulsory Education at Lancaster University, claims in a paper to be delivered to the Association of Colleges in Further and Higher Education that there is evidence to support a connexion between shrinking age groups and participation rates. Marginal candidates may be more likely to be encouraged to try for a place when competition is less intense and the value of a degree in the employment market is also increased.

But such factors will do no more than partly smooth out the sharp lines of demographic oscillation, according to Mr Fulton, and higher education institutions will have to adapt themselves to keep up numbers. He advocates a more flexible pattern of courses and admission requirements.

Mr Fulton claims that the low drop-out rate in British higher education achieved at too great a cost, denying the opportunity of study to many who might benefit. And he maintains that lottery would be a better method of selection than A levels.

A range of criteria should be applied when considering candidates for higher education, including aptitude, tests, credit for work and life experience, and positive discrimination to encourage under-represented groups. At the same time, more variety should be introduced on the length and type of courses to attract students not suited to conventional degrees.

Double demand to boost training

A call for minimum entitlement to training for employed adults and an extension of the 21-hour study rule for the unemployed, came from the National Economic Development Office yesterday.

Mr John Cassels, director general of NEDO and the former director of the Manpower Services Commission, told the Association of Colleges in Further and Higher Education meeting in London that both elements could be profitable investments for the future. The white paper is silent on a minimum entitlement, but I believe that by one means or another, it needs to be in this country," he said. The 21-hour study rule is a useful

Council seeks to engineer £200m shift

by Jon Turney

Science Correspondent
The Engineering Council has spelled out its aims for engineering education over the next five years. They include a 10 per cent national swing from arts to science places on degree courses, more money for engineering education and a new scheme to promote secondment of academic staff to industry. And the council wants to see a £200m shift in Government funds to boost engineering training in industry.

In two policy statements issued this week, the council takes up the resource implications of the general educational goals it outlined last year. The statement on resources for engineering education calls for earmarking of special funds for courses, linked to the council's system of accreditation for enhanced and extended degree courses. The council recommends that

£7m a year be earmarked to support industrial secondments for 500 staff each year.

The paper also says equipment in both university and polytechnic engineering departments is often obsolete or worn out, citing the recent report from Her Majesty's Inspectors in support. It calls for a national average equipment grant in these departments of £600 per student, and says the Department of Education and Science, the National Advisory Body and local authorities should review the way cash is provided for equipment in the public sector.

The council says the same arguments on staffing and equipment apply to advanced further education courses as to degree courses. And in all areas the statement argues that short-term action is needed to meet the long-term goals, including shifts of resources to

science and engineering, outlined by Sir Keith Joseph, Secretary of State for Education.

The council's second paper, on funding of training places, criticizes the Government white paper *Training for Jobs* for not recognizing the need for long-term support to secure industrial places for trainee engineers. The council paper argues that economic pressure has forced industry to cut spending on training, and the Government must step in to make up the shortfall.

The discussion document puts forward a system of payments including £50 per head per week for industrial training for future chartered engineers, costing around £80m a year, and payments to companies providing training for technician engineers and engineering technicians costing around £130m a year.

Cambridge rethink on admissions

by Paul Flather

Cambridge University colleges are to study ways of reforming their entrance procedures for undergraduates, including a scheme which could mean S level examinations must be equivalent to their special entrance examinations.

The colleges now accept that the entry examinations - taken after A levels in the seventh term of the sixth form - is set to wither away and they want to find the best alternative time for the examinations.

Cambridge has been graded into action partly by the decision last year by Oxford colleges to abolish seventh term entrance, partly by one of its own number, Emmanuel College, deciding recently to admit students solely on A levels in future, and partly by general criticism of Oxbridge entrance working against state school applicants.

Representatives from all the 26 main undergraduate colleges are meeting today to finalize arrangements to set up the working party headed by the vice-chancellor, Sir John Butterfield, to look at the feasibility of moving the examination to the fifth or sixth term in the sixth form.

Such a move would still leave Cambridge out of line with Oxford colleges, who after a long and careful deliberation plumped for a fourth term entrance examination or entry based on A levels, interview, and school report.

Mr John Hopkins, senior tutor of the college tutorial representatives' committee, said all options were still open but colleges were keen to explore the arguments for a fifth or sixth term entry before making a final decision.

He said most tutors now accepted that seventh term examinations were going to wither away. State schools often found it difficult to put on the extra coaching needed, while independent private schools were losing interest now that Oxford and Cambridge had abolished entrance awards.

entrance surviving much beyond 1985," he said. "So far as fourth term entrance is concerned we have not foreclosed that option. But we are interested in fifth and sixth term options."

One scheme under review will be to see if S level examinations could be used by Cambridge as equivalent to an additional entry examination.

But the Dover committee at Oxford, which eventually rejected the fifth or sixth term option, found concern from other universities about possible delays as candidates waited to hear of their Oxbridge applications, before pursuing entry to other universities.

news in brief

Ex-apprentice to be principal

Professor Harold Hankins, who started working life as an apprentice, has been appointed principal of the University of Manchester Institute of Science and Technology. He has been acting principal since October 1982 following the early retirement in June of Professor Robert Haszeldine.

Professor Hankins, who will take up office on March 1 has had 17 years of industrial experience, and 2 as an academic. He said that under his principalship UMIST would "be reinforcing its links with the University of Manchester, which go back 80 years, to develop a joint approach to planning, while maintaining UMIST's cherished independence."

Bishop's move

Roman Catholic bishops have renewed their attack on the Secretary of State for Education for his decision to close teacher training at De La Salle College in Manchester without the full promise of revocation of its case.

Bishop Daniel Mullins, one of the governors of the college, has written to Sir Keith Joseph saying that his last letter only confirms that the closure was a pre-judged issue.

Neo-expressionist

The Royal College of Art this week named Mr Jocelyn Stevens, the former managing director of Express Newspapers, as the surprising choice to succeed Dr Lionel March as rector of the Royal College of Art.

Mr Stevens, aged 52, is now a director of Centaur Communications and will take over the post in September. The appointment was applauded both by Sir Hugh Casson, as provost of the college, and by Henry Moore, who is a former member of staff and a benefactor.

Merger delay

City University has postponed its special senate and council meetings due this week to discuss possible merger with the City of London Polytechnic. The meetings, postponed because the Inner London Education Authority officers have not yet made recommendations, will now take place in two weeks time.

City University students' union has voted not to cooperate with a feasibility study for the merger, saying they believe it will lead to rationalization, and opposing the merger on those grounds.

Adams decision

Leeds University students will decide early next week whether to drop plans to invite Provisional Sinn Féin president Mr Gerry Adams to speak to them. A referendum has been requisitioned by 450 students after a general meeting voted against the wishes of union president Ms Sally Ryder to invite Mr Adams.

But Provisional Sinn Féin has already indicated that Mr Adams will not be able to accept the invitation in the near future because of other commitments. Including his work as a Westminster MP.



Students from Hull University's Pooh Bear reading assistance society staged a 15-hour sponsored hopscotch last weekend to raise funds to buy a new minibus and improve the society's stock of children's books. The society has been running for eight years, providing help to problem readers.

Owen calls for new policies

Social Democratic Party leader Dr David Owen believes his party's education policies need updating. He indicated to student Social Democrats at the weekend that he was not entirely happy with the policies as they now stood, and endorsed their plans to broaden them into an instrument for social change.

SDP student leaders feel existing policies may have concentrated too heavily on links with training and the acquisition of qualifications for employment. They believe there is scope for a shift in emphasis in the relationship be-

tween existing policies and other aspects of the party's policy.

The students now aim to begin a debate within the SDP about the future shape of the policy. The conference also called for a common age of majority at 16 for all purposes. This would involve reducing the minimum age for a Westminster MP from 21 and eligibility for voting from 18.

Delegates also demanded a policy of positive action to ensure fair representation of women on committees and in elections but rejected by a small majority a move which would permit single sex meetings.

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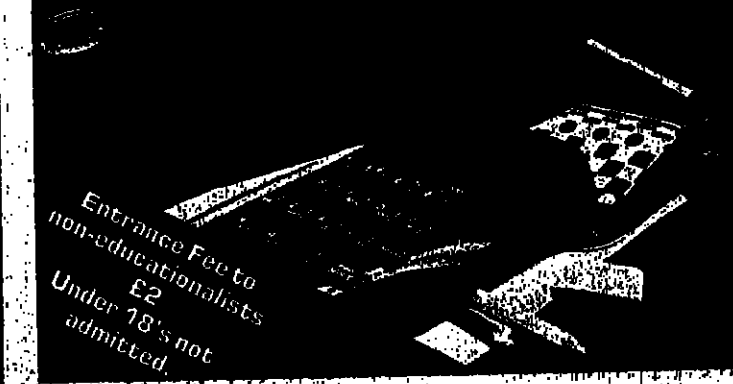
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overseas news

overseas news

Aid group examines budget

from E. Patrick McQuaid

CAMBRIDGE, MASS The Action Committee for Higher Education - a clearing house on American student aid programmes - has come up with a detailed analysis of Mr Reagan's proposed budget.

It says that as a result Pell grants would be reshaped into a new Pell self-help grant programme, which the White House claims would be sensitive to both educational costs and family income. Students would have to contribute a minimum of \$500 or 40 per cent of the college costs through work or loans before receiving a grant under the proposed programme, which has a budget of \$2.8 billion.

The maximum grant would be raised from \$1,900 to \$3,000, but eligibility requirements would be restricted by raising taxation rates on discretionary family income. The administration estimates that 290,000 fewer awards would be made than currently are available, and 80 per cent of the requested funds would go to students with family income under \$2,000.

Direct loans would no longer receive federal capital contributions, which currently total \$161m and provide 149,200 awards. The administration estimates that continuing payments into the revolving funds from prior loans will provide \$585m for loans to 731,000 students. Legislation will be proposed to increase the interest rate from 5 to 8 per cent.

State student incentive grants would be eliminated, jeopardizing 304,000 awards and \$76m in state-matching funds. Although many states over-match, at least 15 rely on the federal share for 45-50 per cent of total funding.

College work-study would be increased by \$295m from the 1984 fiscal year level of \$555m. The number of awards would be increased from 870,000 to 1.2 million, and the average grant would rise \$800 to help students meet stricter self-help requirements for Pell grants. Institutions could use up to 50 per cent of their work-study funds for grants, and up to \$100,000 for cooperative education, adult literacy courses, or job location and development centres.

Guaranteed Student Loans would be revised to require all recipients to take a means test. This would significantly restrict access to loans by graduate students as well as independent undergraduate students in public institutions. Substantial savings would be sought through legislative changes to increase state loan agencies' share of default and administrative costs. GSL costs are estimated to increase by \$584m to \$2.9 billion.

The Trio programme would be halved to \$82m from the current \$165m. The stated purpose is to focus aid on institutions with predominantly minority enrolment, although seven out of ten black students and more than nine of ten Hispanic students are enrolled in majority-white institutions. Legislation will be proposed to require institutional matching of federal grants and to consolidate the talent search and the Educational Opportunity Center's programmes.

It is proposed that graduate support be eliminated barely seven weeks after the bipartisan National Commission on Student Financial Assistance reported "serious signs of distress" in this sector, unanimously declaring that "federal support is indispensable to

excellence in graduate education". Some 1,700 graduate and professional opportunities fellowships for minorities attending law school, and law school clinical experience grants now total nearly \$16m.

An education savings account is again proposed to "encourage low and middle income families to save for their children's future". Families would be able to make an annual investment of up to \$1,000 per child with tax free interest and dividends. Eligibility for the programme would be phased out at incomes of between \$40,000 and \$50,000.

All higher education act programme would be lost except for two which would be level-funded: the fund for improvement of post-secondary education and Title III grants for developing institutions. College library programmes would be dropped including support for library resources, training, and research libraries. No new loan commitments would be made for either college housing or academic facilities. Cooperative education would be stopped although institutions could use up to \$100,000 of their work-study funds for cooperative programmes. Veterans' cost of instruction would be eliminated because, "as their numbers have declined, traditional support service have been adequate to meet their needs".

The minority institutions science improvement programme would be continued, the women's education equity act and aid to land-grant colleges would be stopped. The National Institute of Education would receive a slight increase and the National Center for Education Statistics would be level-funded.

Germany makes an about turn

from Barbara von Ow

MUNICH The German education minister, Dorothee Wilms, is determined to mark an about-turn to educational realism by amending the federal university law pragmatically and swiftly by the end of 1985.

In her first official statement on the recent recommendations of an expert commission, Frau Wilms announced that she would follow the proposals in all fundamental points.

On no account would there be a total revision of the present law, she stressed, however, some amendments were required as certain existing regulations prevented competition and diversification among the country's universities.

Consultation with all 11 Länder, parliamentary groups and academic institutions would start without delay, she added. A first draft of the new law could probably be submitted by the summer.

The commission was set up by Frau Wilms last year to examine the workings of the 1976 university law which was framed in reaction to the student unrest of the late 1960s. Named after its chairman, Werner Knopp, it recommended a set of moderate amendments increasing the professorial and faculty role.

However, it would not mean cutting on the principle of work representation under which professors, students, administrators, scientists and non-scientists all have their say in decision-making committees.

There could be no reversal to the old style *ordinarier universität*, Frau Wilms underlined, where the professors held the balance of power alone. Existing student rights should not be curtailed, she added.

In line with the Knopp commission, she advocated that the comprehensive university should cease to be a binding model for higher education. Research should be made freer and more efficient by integrating "third means" from non-state institutions.

The minister also backed changes in the middle-level of the academic echelons. She remained non-committal, however, as to whether the commission's recommendations would be applied. Under these proposals, the present two highest levels of C3 and C4 professorships would be amalgamated, while the C2 grade and general all-purpose university assistants would vanish, to be replaced by scientific assistants who would be in the process of qualifying.

Frau Wilms said while there were "other concepts" which had to be considered, the general agreement was that any changes should give young academics better employment chances at the universities.

The proposed revision of the university law, while broadly welcomed by the culture ministers and university rectors, was rejected by the top board of the student organizations last week.

Protest students freed from jail

DUBLIN

Seven Irish students have been released from jail following the end of a protest over the withdrawal of medical cards. The seven had been jailed for refusing to abide by an injunction not to occupy health board offices.

Their release came after negotiations between the students and health sides claiming they had won their point.

The original position was that students would no longer automatically be entitled to the cards which allowed them free visits to their doctors and to prescribed medicines; only those whose parents had medical cards already would be allowed to retain them.

Following clarification from the minister, it emerged that students would be assessed individually - as important, history said the Union of Students in Ireland's president Mr Joe Duffy was among those jailed.

Canadians limit new enrolments

from Mark Gerson

TORONTO Financial difficulties and overcrowding have prompted the universities of Alberta and British Columbia to limit first year enrolment next year to 1982-83 levels.

Admissions standards at the two institutions will remain unchanged, but students possessing minimum requirements only could be turned away. The University of Alberta will accept the top 4,500 applicants while the University of British Columbia plans to admit no more than 3,250 students, regardless of the number of qualified applicants.

The University of Alberta proposed its enrolment ceiling last month, less than a week after the provincial government had promised Alberta's four universities a special \$4m grant to help them absorb this year's increased student numbers. Meyer Horowitz, president of the University of Alberta, welcomed the extra money but said that it wasn't enough. Next year's operating grants for the four institutions have not yet been announced by the provincial government.

At the University of British Columbia, governors were worried about quality in the face of an expected 6 per cent drop in provincial funding for 1984-85. They are unlikely to alter their December decision despite last month's provincial budget, which reduced next year's operating grant by 5 instead of 6 per cent.

Students refused admission to the two institutions would turn to other universities in the two provinces, where enrolment policies are still under review.

The University of Calgary, the second largest in the province after Alberta, may add more programmes, but has no plans for an institution-wide freeze.

In British Columbia, the University of Victoria is studying a limit on first-year enrolment, while Simon Fraser University has yet to implement an undergraduate population ceiling of 11,000 proposed in May.

Other Canadian universities have also taken steps to limit admissions in an attempt to cope with inadequate funding.

Black students return to classes

JOHANNESBURG

Black students at Natal University medical school returned to lectures this week without their grievances resolved. The school was closed by the university authorities on February 3, a few days after the students began a boycott.

Unhappiness had arisen among students over the high failure rate at the end of last year and over a recent rolling plebiscite which failed to open a supply and not only the subject they had failed. The students pointed out that, despite stringent entrance requirements, 45 per cent of second-year medical students failed.

The students decided to boycott classes when the administration refused to discuss the failures.

Australia told to 'jettison' the education lifeboat

from Geoff Maslen

Australia would have to jettison the "lifeboat model of education", with its assumption that sufficient could be learned before entering adulthood to last a lifetime, according to Professor Ron Johnston, a philosopher of science at the University of Wollongong.

Instead, education would have to be based on a continuing process of learning and relearning. Refresher courses would have to become the norm and not the marked exception. Professor Johnston, director of the university's Centre for Technological and Social Change, said the education system would have to enter the workplace on a permanent basis and become an essential component of work itself.

At the same time, traditional institutions could no longer hold a monopoly on education and in future would play a much smaller role in the total effort. Delivering a powerful and sustained critique of current educational practices to a seminar at Deakin University, Professor Johnston called for radical rethinking about the purpose of education if Australians were to cope with the rapidity of technological change.

Commentators had even begun to speak of the "half-life" professions - "the time taken for half the graduation package to decay". On this basis, there were suggestions that half of what

engineers and doctors learned during years, for physicists perhaps eight years.

He added that an education which was too closely tied to a particular job requirement or set of skills would rapidly become obsolete. As well, work would occupy a lesser role in future. Education would have to assist in preparing for the considerable non-work component of life and for a society in which change and uncertainty were the norm.

But Professor Johnston did not seem sanguine about the ability of Australia's tertiary institutions to change. They remained, he said, steadfastly committed to views about learning, education and society that were more appropriate to the nineteenth century than to the realities of late twentieth century post-industrial society.

Yet change was imperative. In future only 8 per cent of a person's life would be spent in work.

Post-secondary education would have to be reorganized towards a two-tier system. The first level would provide a basic tertiary education to as many people as possible while the second would allow necessary specialization thereafter.

Education institutions would have to step outside their traditional roles in order to remain a significant component of "post-industrial tertiary education".

Yugoslav research concern

The social role of academic research in Yugoslavia is causing concern to the State and Party authorities. According to a recent survey, carried out by the Yugoslav Federal Council for questions of Social Order, major shortcomings included the "deterioration of the material possession of science" - cut-backs in funding due to the current economic crisis, lack of properly trained academic staff.

Between fundamental, applied and development research and "insolvent cooperation" between science and the economy.

Research funding in Yugoslavia is a complex matter, dependent, ultimately, on the principle of "self-management", by which research funding is decided by committees of interest, which theoretically represent the intellectual carrying out the research and

the workers who produce the capital to fund them.

In fact, according to Dr Radoslav Ratkovic, who represented the survey's findings to the Federal Assembly, the workers have abandoned interest in the research sector. Dr Ratkovic called for efforts to be made to improve the socio-economic position of scientific and academic research, by means of "income-based" pooling with the production sector, and for the creation of conditions in which research would make a real contribution to efforts to increase income.

Dr Ratkovic maintains, would encourage the workers to vote larger investments in science from their factory earnings, and to be keen to implement research results in practice.

Nordic five to increase collaboration

from Donald Fields

HELSINKI Leading researchers of the five Nordic countries - Denmark, Finland, Iceland, Norway and Sweden - look set to collaborate more closely following the first-ever meeting under the aegis of the Nordic Scientific Policy Council (FPR).

Founded last year to advise the Nordic Council of Ministers and encourage cooperation among researchers from countries sharing a common sense of values and considerable linguistic affinities, the FPR recently submitted the first of its triennial sets of guidelines for review by researchers, administrators and politicians.

Cooperation within the region has been institutionalized since 1952 in the Nordic Council, an organization that receives most publicity when parliamentarians from the five countries gather for an annual debate on matters of common concern. Out of the council has mushroomed an array of bodies meant to facilitate social, economic and cultural togetherness - though the vision of a Nordic economic union proved politically impracticable.

There has been financial blessing for cross-fertilization of ideas since 1979,

when the council decided that 1 per cent of public funds channelled into research - which then totalled around £1.65bn a year - should be earmarked for inter-Nordic cooperation.

At the inaugural meeting in Helsinki, Dr Elisabeth Helander, chairperson of the FPR and research director at the Finnish Academy, stressed that the funds involved were small compared with those used for international cooperation elsewhere. Furthermore, maintaining contact between Nordic researchers was impaired by expensive fares across the scantily-populated region, lack of harmony in qualifications from country to country, and high taxes that tend to drive the best talents abroad.

However, the FPR, having already sponsored a successful series of workshops in data technology, feels well-placed to spur the rational pooling of resources within the region, and to cut out unnecessary duplication in the research field.

What the European Science Foundation justly calls the "Nordic Mafia" is a force to be reckoned with through its common approach to problems and its way of shuffling off the barriers of Finno-Ugric Finnish, isolated Icelandic

and Glottal top-crown Danish to assert that a hybrid Scandinavian form of communication exists. (In fact, conversations between, say, Danes and Finns, generally go more smoothly in English.)

While recognizing the fund of goodwill that exists between Nordic researchers, outsiders are somewhat sceptical about the potential for a centripetal welding of their work. Geopolitically, the region is marked by such centrifugal trends as Denmark being drawn towards the continent through its EEC links, Norway cutting a constantly more Atlantic profile, Finland paying lip service at least to research exchanges with the Soviet Union, and Sweden being held less in awe by its neighbours though its input into research is far greater than theirs.

Ben Martin and John Irvine of the Science Policy Research Unit at Sussex University - who are well-known in Norway for the sort of evaluations that the FPR is eager to undertake - take a cautious view of the fruits that intra-Nordic cooperation can yield. Martin recalls that it took the 12 member-states of the European Organization for Nuclear Research (previously called CERN) about fifteen years to work

effectively together. Irvine feels a lot of thought should be given to identifying the opportunities for collective research, and to assessing project selection, management and appraisal throughout northern Europe.

Having commissioned two other members of the unit - John Surrey and William Walker - to analyze the openings for cooperation in energy research, the driving forces of the Nordic Council are convinced that the benefits of teamwork far outweigh the costs.

"It's a matter of the underlying cultural background," says one Nordic official. "We have old traditions of contact and working together in our universities, the sort of thing you don't get in a big international set-up."

Whether this is simply a matter of vested interests defending what some observers see as a rather cumbersome bureaucracy may be revealed as Nordic researchers evaluate the results of their own work. Meanwhile, the FPR can point to several promising ironies in its cooperation fire - a telescope to be located on La Palma, a proposed heavy accelerator, and collaboration in such varied fields as data, agricultural and veterinary research.

Protests as Turkish debate rages

from Bernard Kennedy

ANKARA Parliamentarians and workers alike have been "voicing with their feet" against the new administrative structure of Turkish higher education. As the Turkish parliament debates the bill, opposition MPs staged a walk-out in protest against the new structure.

The bill, which would reorganize the national assembly here in Ankara, the rector of the Bosphorus University in Istanbul was announcing a two-week extension to the mid-year vacation necessary by the reorganization of some 180 non-academic staff.

The Three-month-old Turkish parliament is strongly divided on the subject of the Higher Education Council, set up by the military following the 1980 coup to oversee all aspects of higher education. It was when education minister W. Vehbi Dincelir refused to answer questions about the council and called one of its members to the parliament that the military intervened.

Professor Guller Ataman to the rostrum that politicians of right and left decided to quit the chamber. Mr Dincelir had explained that the HEC was not established by the ministry but it is precisely the lack of government and parliamentary control over the all-powerful centralizing body that angers MPs.

Three winters of discontent have now passed since the HEC came into being with hundreds of teaching staff being sacked or resigning, hundreds of students being sent down and most top jobs changing hands. Opponents of the council hark back to the system set up in the 1960s when each university was essentially independent and appointments were by election.

One example of this independence is that non-academic staff working at the universities had the status not of civil servants but of "public sector workers" which entitled them to higher incomes and better pensions. They have now lost this status and many have resigned and taken severance pay as workers rather than agree to become civil servants. This has led to cold lecture rooms, queues for buses and a backlog of paperwork at more than one university and to the postponement of the new semester at the English language Bosphorus University.

Students at the University of Toronto who refused to write a final examination in sociology last semester will receive course credits based on their term work. University officials originally threatened to fail the 37 students unless they agreed to take a test.

The students had argued that it would be hypocritical to be tested in a course that stressed the irrelevance of examinations. The sociology in education course taught that exam marks are poor indicators of achievement.

Practising what is preached

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'Unplanned' universities criticized

from D. B. Udalgama

COLOMBO

Ruhuna University College, set up in 1980 in the south as an affiliate of the University of Peradeniya, was elevated to full university status on February 1, against a background of criticism over the proliferation of unplanned universities and faculties.

It has at present three faculties, art, medicine and agriculture, scattered several miles apart from one another - an arrangement not considered to be welcome to the authorities since it makes concerted action by students difficult.

A panel of professors of the University of Jaffna, under its vice-chancellor, Professor S. Vithanadan has in the meanwhile submitted a plan for setting up faculties of engineering, agriculture and law - also at sites distant from one another. The plan also envisages the expansion of the present science and medical faculties.

Under the expansion, if approved by the University Grants Commission and funds provided, will fail to solve the immediate problem of the displaced students.

However, the chairman of the UGC, Dr Stanley Kalpage, has criticized the "hasty and unplanned" establishment of universities and faculties.

Lecturers claim harassment against Arab students

from Benny Morris

JERUSALEM

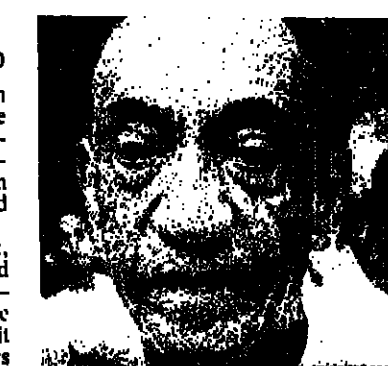
There are some 300 Arab students in Ben-Gurion University and a university official said there had been no complaint from the students about police harassment.

Meanwhile, the state attorney is pressing the state's case in the Israeli high court of justice. Against an Arab student whom it maintains will subvert other students if allowed to study in the Herta Technion, Israel's technological institute.

The security authorities months ago issued a town confinement order against Missara Said, of Acre, prohibiting him from reaching Haifa, where he is a student of administrative engineering.

Said appealed to the high court - Israel's highest judicial authority - for the annulment of the town confinement order, which, he says, makes it impossible for him to study. He asked that the court either allow him to travel from Acre to Haifa three times a week.

According to the representative of the state attorney's office, Eli Ben-Tovim, Said is a member of the pro-Arab, Progressive National Movement, which has in the past advocated the dismantling of the state of Israel and its replacement by a Palestinian state.



The University of Jaffna, he said, was still suffering from the effects of an unplanned setting up of a university. Batticaloa (University College) was "limping along" without adequate laboratory and class room space and, above all, qualified staff, specially in the Sinhalese medium.

Dr Kalpage said that it was, therefore, illogical and irresponsible for the UGC to support the creation of new faculties in existing universities or the setting up of new universities without careful thought and planning, assured funds and adequately qualified staff. In fact, the UGC was mindful of the admonition given by President J. R. Jayewardene, who is also minister for higher education, that we should now

Medical loophole

from A. S. Abraham

BOMBAY The Medical Council of India (MCI) has denied recognition to six medical colleges in four different states for providing sub-standard clinical training facilities.

For a number of years, the colleges have been functioning on the basis of temporary recognition, renewed every year after an MCI inspection. The denial of recognition follows the last such inspection some two months ago. If they take remedial measures and come up to scratch, temporary recognition will be restored.

A further five colleges in the country have not been inspected and do not have even temporary recognition but carry on functioning nevertheless. This is because of a legal loophole which educational entrepreneurs have been able to exploit and which the MCI has been unable to close.

So long as new medical colleges are affiliated to a university which has a recognized medical college, they can go on preparing students for the degree which the university will award and which will be recognized everywhere.

The MCI has been trying to have the law changed for a decade, but the federal government is reluctant to do so for political reasons.



Getting the ratio message

"The plans for local authority higher education assume the achievement of a significant tightening in staffing ratios in 1984/85 through the loss of compulsory redundancies..." This quote from the recent Expenditure White Paper encapsulates the essence of Government plans for higher education in the public sector for the next financial year. Not that the plans for other sectors of education appear much more inviting, but obviously the Government feels able to spell out their message for public sector higher education fairly brutally. As if redundancies were not had enough they now feel obliged to insist there must be some compulsory redundancies. Presumably lecturers in polytechnics and colleges have not yet sufficiently taken to heart the Government's message and the short sharp shock treatment if it hasn't worked elsewhere, might perhaps bring results in higher education.

The Department of Education and Science is not slow to get the message. Having been largely rendered impotent by the Manpower Services Commission and the Department of Employment in respect of important sectors of further education, the obviously hangs heavy in the senior ranks of the DES. They have therefore decided to turn their attention to higher education to prove that they too can plan the education system in the cold hard world of the 1980s. Their latest proposals to the National Managers or employers. A paper presented to the National Advisory Body group which deals with resource allocations attempted to pinpoint the number of staff which institutions ought to use. Each major institution has had its existing staffing ratio calculated and compared to the staffing ratio which the DES would like to see imposed.

For many years the DES has struggled to impose staffing ratios centrally on the major institutions in higher education. Generally such efforts have been defeated since local authorities as employers, and governing bodies responsible for their local authority for the management of their institutions have developed staffing strategies in the light of their resource allocations and their plans for academic development. The difficulties facing institutions have increased over the years as the Government has successfully squeezed resources for higher education. The DES apparently believes that the imposition of staffing ratios is essential to a well-run system. It has therefore made repeated attempts from within the National Advisory Body and externally, to foist upon the NAB detailed staffing ratios for programmes, institutions, and the system as a whole. Repeatedly, the NAB has had to tell the DES, with increasing asperity, that it is neither the job of the department nor the NAB to seek detailed control over staffing levels in institutions.

NAB should now respond to this latest attempt by publicly stating that it is not their intention to impose detailed staffing ratios, just for once this is something which should unite the local authority representatives, those from institutions and validating bodies and representatives of Nafte and the TUC. The NAB should put an end once and for all to this unwarranted intrusion by the DES.

Jean Bocock

The author is assistant secretary, Higher Education, of the National Association of Teachers in Further and Higher Education.

Britain's law faculties have tended to be seen, and to see themselves, as higher schools producing solicitors and barristers, with a tradition of rote learning of cases.

Admittedly, this image has never been so pronounced in Scotland as south of the border. The Scottish broad-based approach has permeated legal training, which is deductive rather than inductive, and holds jurisprudence, the science of law, in higher esteem.

This is particularly true at Edinburgh University, which has one of the most broadly based law faculties in the country, with departments of criminology, jurisprudence, civil law, Scots law, public international law, constitutional and administrative law, a legal practice unit and an interfaculty school of criminology and forensic studies.

Now in a unique move, emphasizing its commitment to legal study, as an intellectual discipline, not simply a vocational training, the university has merged the criminology and jurisprudence departments and the interfaculty school to form a new Centre for Criminology and the Social and Philosophical Study of Law.

There are few other university law centres. Oxford have a centre for socio-legal studies while Cambridge has an institute of criminology. There is a centre for criminological studies in Sheffield and an institute of judicial administration in Birmingham, but none rivals the range of the Edinburgh centre, or has chairs in both jurisprudence and criminology.

The centre has already aroused international interest, and the Council of Europe has this year funded two fellowships for it. In some ways the centre merely places an official title on interdisciplinary links which have existed for some years.

But there were undoubtedly sound pragmatic reasons for a merger. A university centre has more drawing power than a department or individual when it comes to research funding.

The departments of criminology and jurisprudence were both very small, with staffs of three and four respectively. There were fears that the cuts might force them into traditional alignments with other law departments, while the centre would be left with a few staff members.

And, while not a point the centre would wish to highlight, if the universities suffer more cuts, the loss of a post in a centre with seven lecturers and three researchers, while undesirable, is not the catastrophe it would be in a department of three or four.

However, the pragmatic approach



Taking justice to task

Olga Wojtas reports on a new law centre which has been set up at Edinburgh University

does not devalue the centre's aspirations. There have already been links with staff in subjects such as history, forensic medicine and politics, but these can be much better coordinated through the centre, which is able to elect staff outside the core of the two departments as associated research members.

The centre currently has 20 associates, some from other law departments, but also from social administration, criminology, psychology, sociology, and other disciplines. The centre is also involved in quality in teaching by involving staff from outside the centre, and reciprocating specialized teaching within their departments," says the centre's director and dean of the law faculty, Professor F. H. McCloskey, former head of the criminology department. Courses attract more than law stu-

dents: the majority of students taking the general criminal law course come from other faculties. Professor McCloskey stresses that the law faculty has an obligation to train competent law graduates, but adds that the centre's teaching will ensure an understanding of legal institutions in their social and philosophical context.

"We are moving into a much more complex technological society with a much less clear system of agreed values and this has implications for the lawyer in the future," he says.

Professor Neil MacCormick, professor of jurisprudence, sees the work of the centre as having roots stretching back to the Scottish enlightenment. "Writers like Adam Smith David

Hume and John Millar of Glasgow refused to draw a distinction between what we would call philosophy and what we would call sociology. They had the view that purely theoretical work without any empirical study is empty and purely empirical work without any theoretical underpinning is blind."

Most of the centre's staff would see this as the basis for their teaching and research and would see both parts of their work as equally important.

"The government thinking is that law is a profession, a set of separate activities," says Professor McCloskey, "but research is not an educational luxury, it is part of the very nature of a good teaching department."

Professor McCloskey has carried out work for the United Nations and the World Health Organization on the problems of legislation and methods of

controlling crime, and is currently working on research into prosecution in Scotland for the Crown Office, and the control of crime in Scotland for the Scottish Home and Health Department.

The SHHD is funding another two projects in the centre. Dr Alan Paterson and Dr David Nelkin are examining why some cases come to trial and others do not. "Somewhere between 70 and 80 per cent of cases don't go anywhere near a contested trial," says Dr Paterson. "We're trying to see whether there is some logic to when people plead guilty or whether it is entirely haphazard."

"There's an interesting tie up in the study between practice and research," adds Professor McCloskey. "What advice is being given to people in considering their pleas, and does it remain a just system?"

Peter Young, in a project entitled "Disruptive Youth", is looking at the relations between young people and their communities in four urban areas in Scotland, one considered a success in its police-community relations, one considered troublesome, one a new town, and the last an area with traditional tenement housing.

"The object is to see how youngsters are regarded as disruptive, and is not just concerned with young people who have officially fallen foul of the law," says Mr Young.

"Nobody is quite sure what members of community find most troublesome, whether for example it is vandalism, or children playing in the street."

"Traditional careers have disappeared, and young people no longer face firm prospects of employment. We want to explore what this means for them."

Another of the centre's projects has been commissioned by Merseyside County Council's police committee in the largest crime survey in Britain, and is being carried out by Richard Kinsey. Mr Kinsey is examining how much crime is not reported to the police, and why it goes unreported, as well as the views of victims of crime have of the police. The research has the cooperation of Merseyside's chief constable who has agreed to allow Mr Kinsey to survey the attitudes of police officers themselves.

The centre's approach to research is not likely to be what Karl Popper describes as "piecemeal social engineering," providing answers to problems defined by government, but will be inclined to pose questions itself.

"Obviously the funding agency has certain questions it would like information on," says Peter Young. "But we've never pretended we will provide specific sorts of answers to specific questions. We will provide balanced information which can be fed into the policy processes and we hope this would encourage more enlightened policy."

Professor McCloskey sees research with policy and practical issues would come to recognize the value of this kind of informed approach, and see that all important studies might catch votes but in the end rebound because they don't produce results.

Patrick Nuttgens



Inspiration and enthusiasm: such heady cocktails

On one or two occasions in the last few years when I have been writing this column I have been sufficiently moved by the death of a friend or colleague to turn the column into a kind of critical obituary with personal memories. Now I do so again, saddened and left wondering by the death of David Watson at the age of 50. The respectful obituaries have been rather formal, as if their writers were not quite sure whether to show enthusiasm for his work in charismatic renewal, as perhaps the country's best evangelist. Church leaders are usually - and I suspect rightly - cautious about religious enthusiasm, which can easily tip over into absurdity. For me, knowing David Watson for a few years was an unexpected episode and an inspirational experience, which I find difficult to explain and impossible to judge.

That I should come into contact with him was, I suppose, inevitable in the circumstances. In the 1960s the York Redundant Churches Commission declared about 10 churches redundant, out of the superfluity of parish churches that the Middle Ages had left to the city. I worked in the first such church which had changed its use - St John's Ousebridge, which became the Institute of Advanced Architectural Studies; another was turned into a Heritage Centre later; probably the most successful of all such conversions was St Sampson's, which, because a delightful tiny centre for old folk.

What was especially attractive was that the preacher who could inspire such enthusiasm for God and such love of Christ was the most unaffected companion in ordinary life. I joined him for meals not only in our home but also in his, an extended family or commune, or in the cafe opened by him near the Minster, appropriately entitled the Mustard Seed. I tried to find out, in my sceptical way, what made him tick. I should of course have known the answer. It was simply the love of God.

Of course that really leaves no questions open as answered. And if your whole habit of mind does not easily lead to such knowledge it is difficult to give it anything but a national assent. If I asked him, in a rather biblical way, what I should do to experience that love for myself, he would insist that I was obviously already full of it and would know it perfectly well if I would only relax and let Christ come into my heart. I remained unmoved, and also unconvincingly aware that the love of God must be one of the experiences about which it is most easy to deceive oneself.

I have just been listening again to a recording of the conversation he had with Nick Page on Radio 4 after he learned that he had an inoperable cancer. It was entitled *A Case for Healing* and I believe he thought he was going to be healed. He knew of the volume of prayer being offered for him but accepted that if God had done the work he wanted to do that he would die. With a piece of rationalization that unbelievers might think was an exercise in verbal manipulation, he had moved from wanting to live but being willing to go to heaven, to its reverse - wanting to go to heaven but being willing to live.

That conversation confirmed what had remained in my mind from his many discourses. The two key words in his ministry were love and reality. He frequently used the experience of love in marriage as a metaphor for the love of God for mankind. He insisted that what had made him turn to religion was the discovery of the real, his illness made him come to terms again with reality. He thought of God as being centrally at work in the real even if it could not be scientifically measured.

He found in people's profound love and caring for one another a foretaste of heaven. In my partially convinced but sceptical way I can only hope he was right. In ordinary human day-to-day terms, a totally likeable force for good and for cooperation between people of many races and creeds has gone out of our lives. His departure, with his infectious smile and chuckle, means a little less happiness in the world of many many people.

Yet was not a dramatic departure. He was not a dramatic orator. He was a quiet, steady, and persistent voice. He was a man who had a deep understanding of the human condition and a profound faith in the power of love. He was a man who had a deep understanding of the human condition and a profound faith in the power of love. He was a man who had a deep understanding of the human condition and a profound faith in the power of love.

Welshing on Wales?

The decision to give Wales no extra cash for Welsh teaching has caused bitter disappointment. Ned Thomas reports

The bitter disappointment expressed by the University Grants Committee's refusal to fund any new posts for internal teaching through the medium of Welsh in the five years beginning this autumn, registered something more than an institutional response to enforced retrenchment. There is a sense that a policy has come to an end.

It was not a perfect policy. It came into being as a response to calls for a separate Welsh-medium college and was seen by many as a sop to Welsh feeling in a period when universities were expanding - which in Wales meant becoming more English in their composition; but it did offer a line of advance and demonstrated that a university was doing something. In recent years especially the Board for Welsh Medium Teaching was taking its responsibilities very seriously and seeking to develop a coherent policy of development in a situation made difficult by geography and the institutional interests of the separate colleges, and by the many inconsiderable that bear on student choice of university and subject.

No one can have expected a very generous response to the plans for the next phase put forward in response to the UGC's invitation, given the present climate in the universities, but everyone seems to have assumed that a trickle of new posts was likely to continue, that the policy therefore remained intact, and that any fundamental rethinking might be put off to the late 1980s and early 1990s when an overall drop in student numbers might precipitate a reconsideration of the single Welsh college notion. As it is, the pressures go away.

One of these pressures is on the supply side, and comes from the growth of Welsh-medium education. Though the absolute numbers are small, the growth is steady and the numbers of sixth-formers leaving these schools will increase from now until the early 1990s at least. That much can be stated with some certainty on the basis of the bilingual secondary schools that have recently opened or which are due to open in the next two years. How many of these sixth-formers will go to university, will go to university in Wales, and will choose subjects where Welsh-medium teaching is available, is more difficult to quantify, but that the

groundswell of demand is there cannot be denied.

Similarly on the demand side. In a bad market for graduates, an ability to handle a subject in Welsh as well as English is a valuable qualification. Schools themselves, of course, are looking not just (as in the past) for teachers of Welsh, of which there is now an absolute shortage, but for teachers of French, history, mathematics and all the other school subjects, who can teach through Welsh. Demand also comes increasingly from local government administration in Welsh-speaking areas, and from other public and voluntary bodies.

Then, of course, there are the Welsh media which have seen an immense expansion over the last two years. These not only consume a great deal of the produce of Welsh and drama departments but are an ever-present mirror of the inadequacies of the education system so far as Welsh is concerned. Not a day passes but that the media present, specialists of all kinds, newswriters, specialists of all kinds whose grasp of their subject is advanced and demonstrated that a university was doing something. In recent years especially the Board for Welsh Medium Teaching was taking its responsibilities very seriously and seeking to develop a coherent policy of development in a situation made difficult by geography and the institutional interests of the separate colleges, and by the many inconsiderable that bear on student choice of university and subject.

It is easy to overstate the statistical demand. We are after all talking of a total linguistic group of some half a million people; but one should not underestimate the qualitative strength of the demand. Here is a small nation, with a strong tradition of literacy and learning, which can call on Welsh-speaking specialists in all but the most remote fields of study, which is seeking to keep its language and culture abreast of modern life with a modicum of success; which by today has numbers of employing institutions where Welsh is used, yet which lacks a higher education institution that turns out personnel properly qualified for employment in these institutions.

The feelings of frustration caused by this situation will not go away, indeed can be expected to increase in the absence of a policy. For those who look to international comparisons, the situation is not encouraging. In the United Kingdom, perhaps, the only other country where a language is used in higher education is Scotland, where the use of Gaelic is limited to a few small communities. In the rest of Europe, the use of a language in higher education is rare.

The UGC decision at least has the merit of concentrating the mind. Theoretically the options for the development of Welsh-medium higher education:

1. A concentration of existing courses in one place. This was proposed in 1966 but, founded on the strong traditions and compelling claims of Bangor and Aberystwyth. But as things stand, there is duplication, and concentration would mean a wider choice of courses per student in Wales.

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Preparations for an Eisteddfod. Wales has a strong tradition of literacy and learning.

Lawyers prepare for a battle of quills

David Berry looks at the uneasy relationship between law teaching and the legal profession

When Roger Scruton suggested in *The Times* recently that a law degree might not be the best education for future barristers and judges, he touched a nerve among legal academics. Since the Ormrod Committee into legal education reported in the 1970s there has been an uneasy truce between academic and professional lawyers about the way law is taught in British higher education.

But worry about unemployment in the legal profession, exemplified by a fortnight ago, to end the monopoly solicitors have in house conveyancing, is pushing this truce apart. And, as the correspondence to Scruton showed, the stage is being set for another battle about undergraduate law education.

The grievance that many law academics feel is about the relationship, unique outside medical sciences, between the discipline and the profession. Over 70 per cent of law graduates go on to qualify as solicitors or barristers. The Law Society and the Bar Council grant an exemption to law graduates from doing a general law course provided they have taken a written examination in their core subjects: torts, contract, crime, constitutional and administrative law, land law and trusts. In addition, the Bar Council has insisted that, from 1985, graduates must have first or second class honours.

Law departments accept these standards since if they didn't, their students would have to do another "preliminary" year before their professional qualification. But many law departments in Britain

David Sugarman, reader in law at Middlesex Polytechnic, explains the effect of the core subjects. It has undoubtedly hindered experimentation in teaching law. These legal categories came from a nineteenth century context and are increasingly irrational ways of conceptualizing how law operates. But then the professions have tended historically to minimize theory in law and its historical and social context. Sol Piccolito, a lecturer at Warwick, agrees with Sugarman and argues that "all law degrees have to be approved by their academic councils and this should be sufficient for the profession's general qualification."

Martin Partridge, professor of law at Brunel, is less concerned about the core subjects but finds the Bar Council's insistence on second class honours "objectionable. It limits access. This is not an educational decision but one to restrict numbers." Jeffrey Jowell, law professor at University College London, agrees and added that it was "great shame that the decision was taken without any real consultation with academics."

What also disturbs Jowell is the insistence on written examinations. "This is quite wrong interference. We are moving to a variety of ways of assessment including take-home papers and multiple choice but we cannot do that for the core subjects." These subjects will make up over half a law degree in Britain.

When I but these criticisms to David Sugarman, reader in law at Middlesex Polytechnic, he said of the

Bar Council's Council for Legal Education, he suggested that the academics had a "vested interest." "We felt that the second class students would be an incentive for students to work. The academics don't like it because it will restrict the number of overseas students who can pay but are not up to standard." He also said that they insisted on written exams in the core subjects to prevent "too much room for fanny business."

Christopher Snowling from the Law Society, like Elicana Tenebaum, gave a personal view. Not insisting on the core subjects would be a "dereliction of duty." But they had no plans for introducing a second class requirement.

It is fair to say that many legal academics agree with the Snowling and Tenebaum "traditionalist" view of legal education. They argue that the core subjects and unseen examinations still provide an essential discipline and an understanding of how law works and are applied in society. But since the 1960s there has been a strong movement in academic institutions to regard law as a social science. This has been spearheaded at Warwick and Kent universities and some polytechnics where the law departments have developed a social approach to the subject.

And at institutions like the LSE, University College London, Southampton and Edinburgh universities, where the law departments have been brought in to help teach law. As Professor Jowell explains: "The battle in favour of social science has been won partly due to economists, sociologists etc taking an interest in law and partly due to the SSRC funding legal research and empirical work... But I also think the traditionalist approach is still useful."

But few of the younger social science orientated lecturers share the profession's control of the undergraduate degree. In contrast to Scruton, they claim that the "black-letter" style of law teaching was exactly geared to educating judges and has little relevance to the needs of ordinary solicitors. And, curiously enough, the worsening of job opportunities for solicitors might help their case.

David Sugarman says that lawyers not involved with the professional societies have not had to worry that much about law education in the past. But now the pressures on them to become "qual-businessmen" and go into other areas will mean new pressures on academic law departments against "black-letter" law. Martin Partridge sees the demands of new technology also changing how law is taught. Like Professor Jowell, Partridge thinks that an important element in law education in the future will be lawyers returning to academic institutions for specialist courses. It would be ironic if the independence from the Law Society and Bar Council demanded by the "social" lecturers came not from intellectual argument but from professional need.

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Business & Technician Education

Robert Telford gives a personal view on the formation of technicians

Keeping up with the sunrise industries

As we slowly emerge from recession we also face the challenge of the quickening pace of a new industrial revolution, a knowledge based revolution using Information Technology, automatically performing work previously needing manual or clerical skills. The underlying electronics technology is developing at a great pace and advanced cooperative research programmes such as Alvey and Esprit are essential if the UK and Europe are to keep up with competitors in the USA and Japan.

Survival as an industrial nation (let alone prosperity and growth) demands invention and innovation, combined with investment in, and exploitation of, new technologies. Sunrise industries will grow to exploit new and expanding markets and mature industries will, hopefully, rejuvenate themselves by the adoption of advanced manufacturing technology based on electronics and computers. The adoption of such technology is being hastened by the many awareness and demonstration programmes of the Department of Trade and Industry, and the growing literature including the recent ACARD report on Advanced Manufacturing Technology.

Service industries and local and national administrations will also use the new technologies to be competitive and competent. Indeed, many new service industries are a direct product of information technology itself. A characteristic of a developing high technology industry, is the formation of many small companies, both manufacturing and service, who recruit technical staff in the market-place and whose growth is dependent on the availability and quality of such staff.

There is an adequate supply of entrepreneurial managers, innovative technologists, and appropriately trained technicians. Technicians occupy the ground between craftsmen and fully qualified scientists and technologists and are designated as engineering technicians up to technician engineers. The recession has had its inevitable effect on the required growth in the number of technicians under training

and shortages of particular "electronics" categories are already appearing. At the same time that total demand is increasing, the skills requirement is changing to match rapid industrial changes. Apart from such changes as the need for more electronics and computer-based technicians, I detect a growing requirement for a greater proportion of more highly skilled technicians and also a rapidly increasing need for technicians with multiple skills.

A recent survey of employers' perceptions of TEC programmes discovered that engineering employers required the following options to be added to the main core TEC programme in mechanical and production engineering: microprocessor application; numerical control; computer numerical control; computer programming; computer-aided design and manufacture; electronics; pneumatics/hydraulics; materials.

Another finding of this report was that the level of mathematics taught was inadequate for students progressing to higher levels.

In the engineering industry it is evident that the TEC programmes are generally well regarded, particularly for the flexibility of the system and the opportunity for ensuring that the education is work-related; and also that assessment is related to an ability to do the job rather than to grading.

Over recent years while TEC and BEC have been preoccupied with becoming established, industry has clearly been preoccupied with taking the giant step into a world of high technology. Much has been achieved by the validating bodies, yet their accreditation and quality of staff, of industry working with TEC - in some cases quite unashamedly using its flexible system to produce programmes of study integrating work in industry and in college with both elements contributing to an award. There are unfortunately many more examples where industry has appeared less than enthusiastic - acquiescence is clearly no substitute for direct involvement. Coupled with this must be the recognition that many parts of indus-



Engineering feels that BTEC is doing a good job

try, often smaller companies in the high technology area, do very little, if any training. As industry plans a new product or introduces a new product or introduces a new technology it should at the same time be planning training.

But perhaps herein lies a fundamental problem. The industrial companies with the greatest ability to foresee the changing educational and training requirements are the larger electrical/electronic/aerospace companies and some Government research establishments who currently produce the bulk of the national output of technicians, particularly for the higher level, broader-based transferable skills.

While external demand was comparatively small, companies have been prepared to carry the burden, but in the circumstances of the rapid formation and growth of smaller companies and the needs of the whole of industry and commerce, a real problem arises. Some funding is given by the Engineering Industry Training Board for the provision of additional training places (particularly greater than that provided for and believe that the training infrastructure of these larger companies could handle much greater numbers. But it will need funding on a national basis. The same problem is arising, in an acute form, in relation to the provision of industrial training places for graduate engineers.

One area of constructive collaboration that I find particularly encouraging is the recent agreement between BTEC and EITB for joint certification

covering engineering and industrial training for technicians.

Against a background of a high rate of technological change any country would need a major adult training and retraining programme to enable individuals to play a full part in the changing industrial and commercial scene. But if the pace of change and the adoption of new technology in industry and commerce is to meet world competition, then we have no option but rapidly and effectively to retrain adult engineers and technicians.

BTEC is contributing to the national thrust in this field in many ways and in particular to the MSC Open Tech Programme and its proposed adult training strategy.

From an industrial viewpoint, I believe the Open Tech programme, to be of great importance and the development of appropriate "open" learning materials that allow people to study at a pace, a place and a time to suit them, to be a vital element of the programme. BTEC has a major contract from the MSC to develop and test

supervisors about the application of information technology in business. Many other bodies are involved in this field and in developing distance learning techniques including the use of modern technology in the learning process.

Another encouraging Open Tech initiative is the Southtek Consortium, which consists of 15 firms and 14 colleges in South East England developing micro-electronics and adv-

anced engineering packages.

BTEC has a major central role to play in this adult training and retraining field based on its immense reservoir of acquired knowledge and experience in technical and business courses and its close relationship with industry and commerce, training bodies and educational institutions.

There are many indications that the engineering industry generally feels that BTEC is doing a good job, is travelling in the right direction and has a vital role to play in the provision of vocational training to meet industry's growing and challenging needs.

For the future, the education and training world at large must not only have the capacity for flexible and rapid response to emerging needs, it must also prepare people to live and work in a changing environment. Traditional approaches and techniques for planning, developing, approving and implementing new courses may turn out to be too slow or possibly inappropriate.

This poses an interesting challenge for BTEC which must on the one hand provide a responsive and flexible framework, and I would suggest that the one developed by TEC is a good model, but which must also look to such things as standards, external recognition and career development with all that this entails. I am aware that there is some feeling in industry that the present system of bridges and ladders is too complex to be operated effectively.

Industry, however, needs BTEC to maintain a balance between nationally recognized standards which favour the common core syllabus approach, and the current flexible approach which has given companies the opportunity to develop a much closer working arrangement with colleges to reflect not only the needs of particular industry sectors, but also the necessary local flavour. Given a greater common core approach, high technology industry will still need detailed involvement with curriculum development to ensure that BTEC keeps pace with change.

Relevance is looked for also in access to courses. There are still far too many barriers to access for adult students; barriers arising from time and place from entry qualifications from administrative requirements and Post-experience awards must relate to the market and there is no doubt that too much of the potential market is currently shut out because access is for one reason or another, difficult for adults.

Finally, there must be relevance in the forms of assessment used under the course. Assessment methods must relate to the competencies that are developed during the course, must reflect the learning that takes place and must give students the opportunity to demonstrate what they have achieved.

The author is chairman of the Marconi Company.



Business & Technician Education

BOOK REVIEWS

Motives for work

Organizations at Work, designed primarily to cater for the needs of the BTEC National Certificate and Diploma common core modules three and four "The Organization in its Environment" broadly covers political, economic and legal aspects of organization in our society. The authors aim is to provide students with a guide to the main features of the subject which will enable them to tackle areas of difficulty of exposition and interpretation in a reasoned way. It is a pity, however, that at times the authors find it difficult to achieve the proper balance between exposition and analysis, and between general principle and detail.

Layout is clear, with a good introductory table of contents, outlining form and scope. The style is straightforward and unaffected, with a delightful absence of jargon and circumlocution. At the end of each chapter there are self-assessment questions which should provide readers with a useful yardstick of progress and understanding. Diagrams and graphs are well presented, particularly in the section on market activity of elasticity.

It is refreshing to see a new book that is reasonably up to date and most attractively presented. I am sure students will enjoy using it, particularly as the text is liberally illustrated. Though devised with BTEC students in mind, its approach to effective learning, as opposed to ineffectual cramming, its style and sensible presentation, should make it a useful tool for students approaching any other course of business study at its level.

By comparison, the layout of *The Business Environment* in the same series is somewhat disappointing: there are fewer diagrams and graphs; and where these do appear, they clutter the text. The absence of margins and indentations give the text a dense appearance, which belies the otherwise lucid style.

Designed for BTEC Higher National courses, most of the book deals with the political and economic forces which affect the business environment. However, although sections on finance, markets and government, such as the role of trade unions, industrial relations, and industrial and corporate law, which must form vital aspects of the business environment. The authors write like economists who have been brought up on a diet based on the classical and neo-classical models and who rely on the treatment of trade unions in many of the standard texts. Unions are seen as aberrations or distortions of the free market system, or as mere monopolies. I also

found some of the vocabulary and terminology of the subject occasionally unsatisfactory, although in this business no one can win. Like most other texts in this field it has little to add on non-cognitive skills that is really going to help the tutor, and the treatment of practical skills is weak.

continued on page 15

The scene is set . . .

continued from page 1

trends and changes in skills, knowledge and technology. It is not the task of BTEC, and it would be beyond its competence, to attempt manpower forecasting. But needs expressed by individuals, by employers and by colleges signify real consensus in the market place and in the provision of vocational training to meet industry's growing and challenging needs.

BTEC's fundamental aim is that students develop the necessary competence for success in their careers. This aim underwrites a third function - of encouraging relevance in post experience courses. Relevance has a number of different facets. The value of a post experience course depends upon relevance and it is necessary, therefore, to identify those various aspects of relevance. There must be relevance in the content of the course. That is, what is taught must be up-to-date, directly applicable to current good practice and must provide the basis of skill and knowledge to sustain change.

Relevance is looked for also in access to courses. There are still far too many barriers to access for adult students; barriers arising from time and place from entry qualifications from administrative requirements and Post-experience awards must relate to the market and there is no doubt that too much of the potential market is currently shut out because access is for one reason or another, difficult for adults.

Finally, there must be relevance in the forms of assessment used under the course. Assessment methods must relate to the competencies that are developed during the course, must reflect the learning that takes place and must give students the opportunity to demonstrate what they have achieved.

BTEC's fourth function in the post-experience area is to identify priorities for curriculum development and to encourage advances in relation to these priorities. Relevance in content will point the way to some of the desired developments and the review procedures followed by BTEC in the validation process will assist colleges to identify areas of curriculum development in which further work is required.

Finally, the fifth function that BTEC has to fulfil is that of encouraging the recognition of post-experience work, through promotion and by securing the collaboration of professional bodies in giving credit for what is achieved in the validation process will assist colleges to identify areas of curriculum development in which further work is required.

There is a growing realization among employees and individuals that the processes of updating and of retraining are central to effective performance in work and are necessary also for personal job satisfaction. The range of knowledge, skills and aspirations that BTEC caters for is vital to the economic performance of that country. The provision of a wider range of opportunities for post-experience courses to meet these needs has been recognized by the Government and educational institutions are responding to the needs.

BTEC is not alone in seeking to help

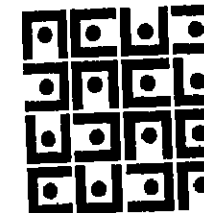
along developments and it welcomes the opportunity to support and to contribute to other related initiatives. The DES PICKUP programme is one related activity that is central to BTEC interests. Another is the MSC's Open Tech Programme work with which BTEC is already associated in a very substantial project for the development of learning materials and delivery systems for post-experience units in computer applications in business. The Open Tech is supporting this project with pump-priming funding of £800,000. There are other agencies with which BTEC will be seeking collaboration in the development of post-experience provision - with professional bodies, with industry training boards and with the initiatives of individual companies or colleges or with consortia of these.

The Policy Statement *Continuing Education for Business and Industry* published by BTEC in April 1983 sets out the framework within which development, and consolidation will be sought. There is a good deal of work to be done on extending the range of awards in the continuing education field and on assessment and on promoting post-experience education. BTEC's role is to encourage and support worthwhile developments, to ensure flexibility and response of provision and to bring post-experience work much nearer the centre of the stage. The scene is set, at least. There now has to be much more action.

The author is head of quality, Manpower Services Commission.

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Series Editor: Barry S. Lee



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January 1984

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February 1984

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May 1984

£5.95 paper 144 pp illus. 09 1549515

HUTCHINSON

Inspection copies and a leaflet giving full details of the series are available from Althea Garwin, Room 7, Hutchinson Education, 17-21 Conway Street, London W1P 6JD.

Demand and response Patrick Raymont on the problems posed by IT

It is a commonplace observation that the rapid rate of change now apparent in so many areas of business and technology has meant problems for our educational institutions.

The cycle of need recognition, curriculum development, course approval, to emergence of students at the end of the course can typically take four to five years; and in fields like computing and information technology, the whole ball game can change in such a period.

In the face of this, there is a persuasive argument which says that education ought not to engage in imparting specific skills, but should concentrate wholly on teaching principles. I believe this to be mistaken.

Firstly a knowledge of principles without a corresponding experience of their application in real life would lead to a sterile attitude and an absence of the factor of "capability" which, it has been urged, we need in our educational system. Secondly, the inertia of the world of business and industry is much greater than one might suppose: for example the personal computer revolution has gone on in parallel with the continued use of conventional mainframe computer systems for the simple reason that there is a considerable investment in such systems which cannot be just written off.

In BTEC the view has been taken, rightly I believe, that the teaching of principles must go hand in hand with the teaching of the current situation as to their application; and this "current situation" can range from the admittedly conventional to the latest state-of-the-art. Of course, such a policy is dependent for its success on having teaching staff who are reasonably able

to keep abreast of the current situation, and with a general tightening of the resources available for staff development one must have doubts about the continuing viability of this approach. It is all very well to inject "new blood" into the system, but what about revitalizing the "old blood"?

The range of the BTEC provision in computing and information technology is very wide. The pre-existing HND/C computer studies provision was taken over and subjected to a thorough revamping. This process is still continuing, with a new variant of the scheme to allow for specialization in industrial systems close to completion.

Furthermore a whole new provision at the national level has been developed. This latter development was triggered by the recognition of the fact that many operator and junior programmer posts in computing can be filled by people at technician rather than technologist level. A pioneering effort in this direction was the National Computing Centre's threshold scheme for unemployed school leavers which had started in 1976 and which consists of a 42 week mixed academic and industrial training programme funded by the Manpower Services Commission. As a result of joint negotiations between the NCC, MSC and BTEC the scheme was adapted to lead to the BTEC National Certificate. A new variant of the scheme was launched last year with an emphasis on business studies. In addition to schemes aimed at those whose main jobs would be computing, BTEC has also addressed itself to the computing needs of the other categories falling within its remit. These days just about everyone in the fields of administration or technology needs some knowledge of the area of computing and information technology.

Appropriate units have been developed for inclusion in BTEC schemes for various subject areas and levels. It does appear, from the normal reviewing mechanisms, that the quality of these units is very variable, both in respect of their specification and in their implementations. It will be important for the new structure to establish ways in which the necessary subject expertise can be brought to bear on the problem of specifying units in new Computing and Information Systems Board. The problem of the quality of the implementation of the units devised brings us back again to the problem of staff development.

Unless substantial resources are devoted to this, there is a danger that the whole scheme will fall flat on its face. A development which, from the special importance, is the provision for the updating of the users of computing and information technology. This area has been addressed through the development, originally under the former BEC post-experience programme, of a series of units aimed at managers and functional specialists (eg accountants) and with titles such as business computer systems, information technology for managers, the management of computer based technology, and data processing systems design.

It is hoped that the widespread availability of these units on a part-time or evening study basis will help changes being demanded of them. This last point brings us naturally to the question of the opening up of learning opportunities to those who, because of constraints of time or location find it difficult to undertake conventional courses. The move by BTEC to develop schemes with support from the Open Tech Unit at the MSC under the "Open BTEC" banner is to be welcomed.

Under the general direction of BTEC and closely involving the NCC, these open learning modules are being developed by two groups initially, one based in the Thames Valley area, the other in the North West. Availability of the first units is expected in 1985.

To the outside observer there appear to be two gaping holes (not unrelated to each other) in the Government response to the need for education and training of the technician level staff needed to support the subject of some work by a small group, currently being considered by BTEC, estimates from the MSC that by 1988 there will be a shortage of 30,000 IT staff at technician level (national level).

Although an outline of the required training schemes is given in the report, it is recognized that a precise survey of industry's needs is necessary to enable more detailed and precise specifications to be given and it is urged that

finance should be made available to enable this to be carried out. The subsequent curriculum development will need to be done quickly if the shortfalls predicted by the MSC are not to become a reality.

The second, related "gaping hole" is in support for IT development in the future education sector. The higher education sector has the Alvey-supported research programme, the "New Blood" and IT initiatives and the National Advisory Body injection for higher national and degree courses. The schools sector has had the Microelectronics in Education Programme and the Department of Trade and Industry "Micros in Schools" scheme. The FE sector must feel lonely and unloved! Yet surely it is at the FE level that the most direct impact on the working population can be made. Apart from the training and retraining of those needed to operate electronic office systems, a quite new need arises for people able to design automated office systems: that is to look afresh at the objectives of the office functions, to configure the appropriate equipment and services and to design the flow of information through the system. The person able to do this needs a combination of the skills of the systems analyst and O&M man plus a knowledge of offices and of office equipment (conventional and electronic). Nowhere in the polytechnics or universities do I see courses being developed to provide such people. Must we stagger by somehow?

The author is manager of the education, training strategy, privacy and security group, the National Computing Centre.

Business & Technician Education

BOOK REVIEWS

Business decisions

Quantitative and Accounting Methods
by T. Daff and G. Blake
Pitman, £5.95
ISBN 0 273 01825 6

Statistics at Work
by Tom Cass
Longman, £4.95
ISBN 0 582 41254 4

Accounting in the Hotel and Catering Industry
by Frank Wood and Peter Lightowlers
Longman, £4.95
ISBN 0 582 41340 0

Economics for Business Decisions
by Frank Livesey
Macdonald & Evans, £7.50
ISBN 0 7121 0593 X

Business education has been subject to a number of conflicting philosophical and pedagogical pressures in recent years, and, in the absence of any agreed synthesis, quite distinct though related approaches have emerged. These approaches may be broadly categorized as: (1) thematic and student-centred (Business Education Council, now BTEC); (2) pluralist but normally derived from a rigorous, conceptual discipline base (Council for National Academic Awards); (3) predominantly concerned with the acquisition of knowledge and technical skills (professional bodies); and (4) the acquisition of technical skills through behavioural learning objectives (Technician Education Council, now BTEC). Such categorization is a gross - and perhaps unfair - simplification, but recognition and understanding of the different and diverse emphasis is an essential prerequisite for any author or teacher. As the editors of the BEC National course, and there is no doubt that, in terms of content, the syllabus is adequately if sometimes idiosyncratically covered. BEC, however, has repeatedly emphasized that the key to a student-centred course lies in the development of a learning and assessment strategy

which places the student in situations and roles realistically related to his actual or immediately intended occupation, and which uses those situations to develop both cognitive and interpersonal skills.

Such an educational philosophy requires a textbook to present a series of carefully graded situations and problems through which the student may be encouraged to deduce the need for and then develop relevant techniques and insights. Unfortunately, the authors of this text seem not to have fully grasped the nature of this learning process, preferring to begin with techniques and then pose problems based upon them, the problems lacking both a realistic context and often tending to have unique and purely numerical solutions. The text does indeed include four longer case-studies - although it is difficult to understand the rationale for basing one case upon the historic development of cost accounting - but these tend to invite an essay style of response in an abstract form.

Statistics at Work is particularly directed towards the BEC National "applied statistics" option. In so far as it is predominantly the options in BEC courses which attract exemptions from professional bodies - and many students are actively seeking such exemptions - BEC has been forced in practice, if not in principle, to adopt in those options a more discipline-based stance, with greater emphasis on the acquisition of technical skills. The author has correctly identified this posture, and legitimately makes claims for the book's relevance to both BEC and some professional courses.

The text is simply written and should help reduce the apprehension which many students at this level feel for mathematical subjects. It is also pleasing to note that several of the assignments draw upon "live" sources - newspapers, government publications - although much more use could have been made of specifically business sources. These assignments, however, do tend to overemphasize the development of technical skills at the expense of a more critical understanding of the issues. As the editors observe, "each chapter concludes with a useful section on assignments, although it is unlikely... these will prove ideal".

Accounting in the Hotel and Catering Industry is focused upon the requirements of a TEC National unit and a closely associated HCMA syllabus. The claim that this is "a textbook



written especially for the hotel and catering industry" seems rather exaggerated, as the book substantially replicates the already well established business accounting text of one of the authors. For that reason alone, it is likely that the text will prove popular with both teachers and students, and will no doubt establish a niche in a rather underprovided sector of the market.

The text, however, faithfully reflects the inadequacies of the curriculum. There is an almost exclusive emphasis on the acquisition of detailed technical skills with scant regard for any critical understanding of the underlying issues and concepts, and the application of those techniques to the hotel and catering industry is minimal and seems almost incidental. Rather than allow for the development of a more critical understanding of the issues, the text seems to be a very different order of priorities - the

encourages the development of accounting skills virtually devoid of the very context they purport to serve.

Economics for Business Decisions is

aimed at a higher level and primarily at a different philosophy of business education - first-year CNAU undergraduate business studies and economics students. This text, written with some rigour and realism, represents within the discipline convention the growing, significant and welcome departure from the often anodyne first-year "positive economics" courses which develop the macro and micro methodologies in a vacuum. Particularly welcome is the brief but adequate introduction to the macro and micro-policy framework within which the business has to operate, the section on non-price competition, and the extent to which the text draws upon actual business situations to illustrate the application of the analytical tools.

First, it is unfortunate that a text which makes such an assignment of priorities includes assignments which invite students - and the more traditional teacher - to retreat into methodological abstraction. Second, business decisions are viewed as a predominantly

technocratic process, neglecting the perspectives of the growing behaviourist school that might have broadened and enriched this most useful text.

These four texts address the different philosophies of business education with varying degrees of success. To the extent that these publications are representative, it is evident that authors more readily assume the discipline mantle, using a methodology to seek out a problem rather than allowing a problem to challenge the student to seek appropriate knowledge and cognitive skills and to develop through it interpersonal skills. Whether BEC philosophy is right or wrong, it has not yet been sufficiently understood by many publications which claim to meet its requirements.

R. J. Bull

R. J. Bull is head of the school of accounting and applied economics at Leeds Polytechnic, chairman of the CNAU business studies board, and a past vice-chairman of the BEC higher level validation committee.

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'which students' performance is to be assessed - an important component of all assignments as one of their major functions is as a means of assessment. It is unreasonable not to detail how and on what criteria students are to be assessed, especially if varied skills, knowledge and activities are necessary to complete the assignments. Despite this criticism, hard-pressed lecturers will find many of the assignments helpful in providing them with ideas.

The Business Organisation and its Environment book one and workbook one fulfil the promise of their preface. Together they are designed for the common core modules two and three. "The Organization in its Environment" - part of the BTEC National Award - Book one is a good basic textbook covering economic, political, legal and social aspects of the business environment. Contents are well laid out, with excellent sub-divisions and a useful index. Graphs and diagrams are clear and unambiguous, particularly in the chapters dealing with market forces and the economic aspects of resources. The sections dealing with the legal implications of an organization contain several relevant cases and summaries illustrating various decisions.

The questions provided in workbook one follow the chapter and are clearly laid out using identical chapter headings. Each chapter follows a similar pattern: multiple choice questions, data assignments, essays, discussion topics, role-playing exercises, environmental and media assignments, and booklets. The purpose of the workbook is to help students to create learning environments by providing situations and assignments which are in conjunction with the required concepts and technology, so that students can gain the ability to identify, analyse and solve in the sphere of business prob-

lems. The tasks encourage students to think, act, and to build an awareness of business problems: they do not just provide them with information. Tutors should find both books very useful for tasks, assignments and problems, particularly if schemes of work are written around the structure of the book. At first glance, two items catch the eye: the proliferation of diagrams, which uses plenty of space, and illustrations set at angles, all making the book look more interesting. Closer inspection, however, reveals a less logical approach than in Frampton, Norrie and Rees's book, which has a more concise and complete text. Nevertheless, both books are written in a simple, interesting way.

Glew and Wells have also produced a slim volume of 14 cross-modular assignments, designed to cover the objectives of the cross-modular elements of BTEC National courses. The first seven assignments are suitable for year one, and eight to fourteen for the second year. They contain the basic themes of money, people, numeracy and communications. However, the assignments in the book vary considerably in quality, from routine and factual tasks to others containing new material.

There is one main area in which the assignments in the book could have been improved: the major emphasis is on report writing and there is little scope for group activity, role playing, or verbal presentation. Indeed, the publisher tells us that "each assignment provides a range of stimulating resource material, and many are based on authentic documents from the real world, such as Macmillan's 1981 Census Form". The book does, however, contain real examples for BTEC. Each chapter is concluded by a series of activities and abilities to be

assessed and used by the reader, which may be more helpful to a genuine reader than they appeared to me.

On the other hand, Clough, Green and Nasta's book contains eight assignments with an emphasis on both verbal as well as written answers; and many of the assignments demand group activities. However, there is no indication of what is needed to reach certain grades. This is a pity, as the cases provided have a ring of authenticity: all three authors write from first-hand knowledge, as well as a familiarity with BTEC philosophy. The book is well laid out and the text supported by informative diagrams that appear on the relevant page.

However, the cases do exactly what the authors say they do: generally cover the major business positions currently held. At the same time they look for an integrated approach, not drawing strict lines of demarcation between subject areas. This is a particularly commendable feature of a textbook which has been written for BTEC Higher National courses.

Although these seven books are a little different from other recent publications aimed at BTEC National and Higher levels, they complement, but do not supersede the work, for example, of Burden, Chapman and Slead's *Business in Society: consensus and conflict* (Butterworths); Whitehead and Barruch's *People and Employment* (Butterworths); Weeks and Jones's *Business Organization, Work and Society* (Holt); Callender and Jones's *The Organization in its Environment* (Hulton); or Milner and Taylor's *The Management of Work: administration in business* (Holt).

Niall Carr

Niall Carr is dean of the faculty of applied studies at Crewe and Alsager College of Higher Education.

Business & Technician Education

BOOK REVIEWS

Building works

Construction Drawing for Technicians, Level I
by R. Boxall
Longman, £4.95
ISBN 0 582 41237 4

Construction Processes, Level I
by Roger Greeno
Longman, £4.95
ISBN 0 582 41309 5

Measurement, Level III
by M. Gardner
Longman, £5.95
ISBN 0 582 41107 6

Concrete Technology, Level IV
by J. G. Gunning
Longman, £7.95
ISBN 0 582 41233 1

Design of Structural Elements
Volume One
by A. G. Smyrell
Longman, £9.95
ISBN 0 582 41229 3

Basic Accounting for Builders
by D. A. Hughes
Longman, £4.95
ISBN 0 582 41351 6

The Business and Technician Education Council (BTEC) was established on October 1st, 1983, to combine the activities previously undertaken by the Technician Education Council (TEC) and the Business Education Council (BEC). BTEC therefore has an inherited responsibility to devise and approve courses suitable for designated vocations, to establish and assess standards of achievements, and to award, as appropriate, certificates and diplomas.

Within the BTEC, the construction sector is now overseen by the construction board and the following books are all within this grouping. Units of study are graded from I to V. The Ordinary National Certificate programme is developed from units at Level I to III, and the Higher National Diploma programme normally uses units at Levels III to V. The units adopted for a course of study may be BTEC standard units or college-devised units and the format of the curriculum unit-based or (subject) group-based.

Boxall's excellent book is closely related to the syllabus contained in the BTEC Level I unit on construction drawing, the aim of which is to develop students' basic skills in the production of graphical information, accuracy in graphical line-work and ability to produce simple working drawings. It also seeks to develop an ability to interpret the information presented on a drawing.

The book leads the student towards an understanding of drawing materials and equipment, introduces the necessary basic skills of draughtsmanship and, finally, by example, encourages the production of accurate, workmanlike drawings. The sequence of learning has been written with care and clearly matches most of the aims of the unit for which it has been prepared. The author has included exercises where appropriate and since exercises in draughtsmanship can only be achieved by practice, these are particularly useful. Only two deficiencies are worth mentioning: the inconsistencies in lettering and the omission of an introduction to axonometric projections.

The book will be invaluable to all beginners who seek to enhance their draughting techniques and is a welcome addition to *Draughtsmanship* by F. Reekie (Edward Arnold, 1976) and *The Manual of Graphic Techniques* by T. Porter (Architectural Press, 1980). Greeno's book relates exclusively to the syllabus of the BTEC Level I unit on construction processes, the aims of which are to introduce the student to processes commonly used in the construction industry, to develop an understanding of such processes and an awareness of the effect on them of working situations and climatic conditions. The unit is also required to promote an understanding of the rela-

tionships between the properties of construction materials and their selection to match functional requirements, and to develop a recognition of quality of performance associated with the successful execution of each of the processes considered.

It is unfortunate that the text follows rigidly the syllabus of the standard unit, as syllabuses are rarely suitable as teaching schedules. The overall impression of this publication is that the author had difficulty in maintaining the simplistic approach necessary for students newly introduced to the subject. Although both the BTEC unit and the textbook purport to relate principally to the construction of the dwelling house, on many occasions the text meanders far from this objective. For example, in the section on excavation, skimmers, draglines and double ended scrapers are described and therefore, by inference, the student must presume that their use is common practice in the construction of a dwelling house. The example chosen is but one of the author's excursions into inappropriate and ill developed explanations and the pity is that such diversions are made at the expense of the introduction of the basic principles so essential to a first unit student.

The textbook makes minimal recognition of the recent inquiry into approaches to the teaching of building technology and building practice. Although it has relevance to the BTEC unit, it will have limited value for students, reading for professional and degree courses in building and surveying. The descendants of Mitchell's *Building Construction - Structure and Fabric*, part one by Jack Stroud Foster (Batsford, 1983) or *Components and Finishes* by Harold King and Alan Everett (Batsford, 1979) - though deficient in building practice, still provide a more effective vehicle for learning at first-year level.

Gardner states in his preface that there are "several excellent well-established books published on quantity surveying", so his textbook has been written principally to assist students in the study of the BTEC unit on measurement at Level III. It closely follows the syllabus of the unit, which is divided into three main sections: measurement of building work and its preparation for further studies in measurement and specification work. Additionally it seeks to provide an introduction to the compilation of Bills of Materials and to use the Standard Method of Measurement of Building Works to develop accuracy in translating drawing work to scheduling of materials. Because the book has been produced specifically for students undertaking general building courses, it contains chapters on estimating and cost control - although these comprise a relatively minor part of the total text. The book is clearly written and well illustrated both with diagrams and worked examples of simple buildings of low-rise construction in traditional form.

The book adopts a traditional approach to the subject of measurement; indeed with the constraints of the Standard Method of Measurement, it is difficult to do otherwise. It joins a competitive field alongside such books as *Building Quantities Explained* by I. H. Seeley (Macmillan, 1979), *Measurement of Building Works* by W. H. Wainwright and R. J.

Whitrod (Hutchinson, 1980) and *Measurement of Construction Work* by G. J. Godwin (Chris-Wilcox, 1980).

Gunning takes a broadly-based approach to the subject. Although his textbook is unashamedly based on the syllabus for the BTEC unit on concrete technology at Level IV, it is recommended to all who seek to improve their knowledge of this important building material. The aim of the unit, and hence the book, is to develop an understanding of the composition, design and production of concrete and also to provide a knowledge of its medium and long-term behaviour. It also examines the problems of transportation, placing, compaction, curing and protection of concrete. An analysis of the behaviour of all types of reinforced concrete is included together with an inquiry into the benefits of destructive and non-destructive testing as a means of quality assurance and control.

Although the student seeking to examine the chemical composition of concrete and to assess its reaction to internal and external influence must look elsewhere, the author, after an inadequate chapter one, does provide a structured and sensible coverage of his subject. The book is well illustrated and easy to read and apart from some confusion between quality assurance and quality control, there are few deficiencies. The most disappointing aspect of the text is its uninspired approach to the teaching/learning process of a subject which could have been enlivened by the inclusion of recommended laboratory work and site investigations.

Smyrell is modest in his claim as to the usefulness of his textbook in the many courses that include structures in their curriculum. Volume one is certainly based on the syllabus of the BTEC unit on design and structural elements at Level IV and discusses the aims of design, the design of beams, slabs, columns, bases and foundations, and cantilever retaining walls in reinforced concrete. This is followed by a chapter on design and detailing of concrete, which is a competent publication, well written, with clear diagrams, and is often difficult to demonstrate a clear distinction between work undertaken by senior technicians and graduates. The author recognizes this and adopts an innovative approach to the problem. Throughout the text, the studies essential for the higher technician are developed along with the more difficult concepts of formulas derivation and the principles underlying the codes of practice. As the latter are clearly defined, this not only widens the scope of the book, but, more importantly, encourages the higher technician to develop an interest in the "why" in addition to the "how". Exercises (with answers) are included throughout. The index of computer programs (though probably out of date) is nevertheless a useful inclusion to this highly recommended textbook.

Hughes's book relates exclusively to the BTEC unit on elementary accounting procedures at Level I, the aims of which are to give the student a knowledge of the principles and practice of accounting applied to the construction industry while defining the differences and relationships between financial accounting and cost accounting. The student is also required to develop an appreciation of the importance of accounting as an aid to effective management and cost accounting and to be able to prepare elementary accounts. The textbook is clearly and carefully written and, for the most part, achieves the required aims, the author confining himself to studies that may sensibly be tackled in a unit at Level I. Consequently, development of the subject is very limited. The examples are useful, except those for value-added tax, where the descriptive text is so brief that it is doubtful if the student will either understand or derive benefit from the studies.

Peter Clark
Professor Clark is head of the department of building and environmental health at Leeds Polytechnic, and a member of the BTEC cross-sector committee on development and review.



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BOOK REVIEWS

Workshop practices

Materials Technology for TEC Level II
by P. F. Kiddle and D. C. Ramsay
Stanley Thomas, £4.45
ISBN 0 85950 372 0

The Structure, Properties and Heat Treatment of Metals
by D. J. Davies and L. A. Olemann
Pitman, £5.95
ISBN 0 273 01893 0

Workshop Processes and Materials, I (Checkbook Series)
by R. L. Timings and T. E. Savage
Butterworths, £8.95 and £4.50
ISBN 0 408 00679 X and 00621 8

Workshop Processes and Materials, Level I
by T. T. Lowe
Nelson, £4.75
ISBN 0 17 741136 8

Manufacturing Technology, Level II
by K. J. Parsley
Macdonald & Evans, £6.95
ISBN 0 7121 1282 0

Manufacturing Technology for Level II Technicians
by Bruce J. Black
Edward Arnold, £4.95
ISBN 0 7131 3485 2

Manufacturing Technology, III (Checkbook Series)
by R. L. Timings and T. E. Savage
Butterworths, £8.95 and £3.95
ISBN 0 408 00698 6 and 00619 6

Control of Manufacturing: an Introduction to engineering management
by C. R. Buchanan
Edward Arnold, £4.50
ISBN 0 7131 3462 3

by W. Bolton
Hutchinson, £5.95

The Technician Education Council (TEC) was set up in 1973 to advise, develop and approve suitable courses, establish and assess standards of performance and to award certificates and diplomas as appropriate. Although the Business Education Council (BEC) and TEC joined forces in 1983 to

Business & Technician Education



become BTEC, there will be no immediate effect on the content and structure of currently approved BEC and TEC courses. Because of this, though strictly incorrect, I will continue to use the initials TEC, because at the present time, they would seem to be more relevant to the books under review.

The definition of a technician is based on two major elements: an industrial element based on job or role specifications; and an educational element based on qualifications. This dual definition leads to the requirement that any qualifications must meet the needs of current or eventual employment. A further requirement is that the qualification obtained must meet a nationally recognized employable standard. One of the main differences between technician education and more broadly based academic education is that, although academic qualifications may have some relevance to employment, their main objective is to provide evidence of a more general standard of achievement.

TEC programmes of study consist of subject units ranging from Level I to Level V. Broadly speaking, Levels I to III relate to non-advanced study. Each unit usually represents a 60-hour lecture course and contains a number of general objectives which the student is expected to achieve. Each general objective is supported by a number of student-oriented specific objectives, the number of which range from as few as 30 to well over 60. An important fact, which is often overlooked by both lecturers and students is that these specific objectives define student achievement, and do not constitute a syllabus. It is up to the lecturer to provide a course of study which will enable the student to achieve all the objectives set out in the unit.

One of the main problems related to the publication of standard units dealing with technology is that once published their content remains static and thus does not respond to current changes due to advancing technology, and production engineering has been

young technician students will be aware that the new technology is the impact of the new technologies on the industries in which they work. For example, they will probably know of a number of systems such as numerical control, computer numerical control, direct numerical control, computer-

aided manufacture, and computer-aided design.

Thus, even though there is no apparent requirement specified in a standard unit, it is vital that new textbooks, while dealing thoroughly with basic processes, should either integrate within the chapter structure or provide an additional one or two chapters giving an indication of how the new technologies are affecting and will continue to affect such processes. Awareness of new technology will, as a result, tend to be built into the next generation of standard units as and when they are reviewed and published.

This leapfrogging process is vital if relevant and dynamic. Therefore, in addition to the normal questions that a reviewer has to ask about a textbook, the following matters, set out in the form of a series of questions, has to be used as a criterion when considering technician education: Does the work recognize the dual definition of technician? Will the student be able to meet the needs of his or her employment? Will the student be able to meet the objectives of the relevant TEC unit? Does the book introduce the student to advances in, and the impact of, the new technologies on the processes and techniques being studied? Despite the inevitable constraints of writing to satisfy the requirements of a standard TEC unit, is the book flexible and technologically relevant and does it involve the student?

These nine books can be grouped under the heading of the standard TEC units. These are: materials technology (U80/738 and U78/476); workshop processes and materials (U80/681); manufacturing technology (U80/736 and U80/737); and control of manufacturing (U75/051 now superseded by U83/188).

The two books on materials technology, by Kiddle and Ramsay and by Davies and Olemann are both characterized by excellent layouts and clear and well-drafted diagrams. Kiddle and Ramsay follow the standard unit almost exactly with the addition of the heat treatment of plain carbon steels and the micro and macro examination of metallic materials. Any lecturer constrained to teaching materials technology to TEC Level II students can purchase this book in the knowledge that it can be used as a course book that will meet the first three criteria of the above model (for the last two criteria in each of the nine cases, see later).

The book involves the student in a study of the subject by means of a series of self-test questions and crossword puzzles (solutions given).

It is such a pity that Davies and Olemann do not cover non-metallic materials because they give a very clear coverage of the metallic content of the TEC Levels II and III units. The lecturer choosing this book will do so knowing that it will last for two years of

study on the metallic elements of the units, but that it will have to be supplemented by additional notes or an additional textbook covering polymers and composite materials. The problems of getting technician students at non-advanced levels to purchase two books on any one subject in a single year are daunting indeed. Lecturers teaching TEC units will therefore tend to opt for books which completely cover all the objectives in a given unit as Kiddle and Ramsay have done at Level II.

Davies and Olemann's book does have a more modern approach than the other two, and it may well find an appeal to students on TEC Diploma courses. Judged against the model, I feel that the authors were more concerned about their subject than the education of technicians. If, however, a lecturer or a student is looking for an excellent introductory text on metallic materials then Davies and Olemann's book should be given serious consideration.

The two books covering the workshop processes and materials unit are again both characterized by clear layout and clear, well-drafted diagrams, with the minor exception that Timings and Savage do not deal with sheet metal operations. This is a curious omission, and one can only conjecture that it has been left out in error.

Lowe's book is a pleasure to read and third the width of the book on most pages, to enable the reader to make notes and comments as his or her studies proceed - an important factor in getting both student and teacher involved. With its clear layout, typeface and profusion of beautifully drafted diagrams, this book must take the prize when compared with the other eight books in the review.

Timings and Savage's book is one of the pocket-sized Checkbook Series and consequently has reduced printing, which I find most irritating. If the book should be an aide-memoire to supplement longer and more traditional texts, then this one has failed. If it were printed in normal print, it would be longer than any of the other books in this review. For this reason, the book adequately covers all the material in the TEC unit, with the small exception noted above, and is well worth considering as a recommended student textbook. Both books meet most of the criteria outlined in my introduction to this review.

Parsley and Black both adequately cover all the objectives specified in the TEC standard unit on manufacturing technology at Level II. Parsley's book is more intellectual and detailed, not surprising as the general editor for the series is Dr Edwin Kerr, Chief Officer of CNA, the subject editor is G.A. Woolver, from Kingston Polytechnic,

and the author hails from Oxford Polytechnic - all chiefly concerned with CNA courses. I for one would be more than willing to recommend this excellent book as a course text for full-time diploma students.

Black's book is smaller and much less detailed than Parsley's, so lecturers will need to supplement the material with extra notes and handouts. This makes the book most suitable for part-time day and evening students who often need to supplement the habit of purchasing and reading textbooks.

Although Timings and Savage cover all the general objectives specified in the Level III unit, their book is again abbreviated, more so than the one on workshop processes and materials. At first sight, it would seem to adhere more closely to the objective of the Checkbook Series. Once again, however, if this book was printed in normal print, it would be an excellent textbook in its own right. Together with the other two books in the manufacturing technology group most of the criteria for technician studies are met.

The lecturer faced with teaching control of manufacturing is faced with two serious problems. The first is that most technician students studying at Level III tend to be young and immature. They have little or no practical experience of management or supervision, and tend to be exclusively absorbed in studies related to their craft and specialist skills. This makes the subject difficult to absorb. In an attempt to overcome these problems standard unit U75/051 was withdrawn in August 1983 and replaced by half unit U83/188, the aim of which was to give students a brief appreciation of the organization of manufacturing companies and an understanding of the basic elements of a production system. The objective is to explain to the technician how and where he fits into the total structure of an organization.

Though well produced, neither of the books in this group reaches the excellent standard of presentation in Lowe's book. Although Buchanan's book provides complete and adequate coverage of all the general and specific objectives specified in U75/051, it is this precise application to the old standard unit that makes it difficult to use as a textbook for the new one - which is much more general and tends to deal with organizations rather than specific techniques. However, the old unit will continue in use for some time and I am presently approved programmes are phased out. Lecturers can therefore purchase and recommend Buchanan's book in the knowledge that it will provide all that is needed in a fairly abbreviated form for a study of the old unit, and that it will be current for two to three years at least.

Although Bolton's book more than covers all the objectives of U75/051, it has been written in a more flexible style - which should make it a suitable basis for studying unit U83/188. However, because of the more general approach of the new unit, supplementary notes and handouts would still be required. Also, because the book has been constrained to a mere 107 pages, some sections suffer as a result of severe editing.

Although these nine books do meet the first three criteria outlined in my introduction, they sadly fail to meet the fourth requirement and most are clearly unsatisfactory in terms of the fifth criterion. None of the books (apart from a few lines in Bolton's book) mention the current impact and future effects of the new technologies. I cannot help feeling that this total disregard of an all-pervading and rapidly developing new area of related study is a reflection of depressed attitudes in Colleges and Polytechnics. This has been created by a predominantly aging profession and compounded by the refusal of local education authorities to recognize fully the need for adequate new high technology equipment and associated development programmes. Most of the books reviewed were quite inflexible in their approach, despite protestations on their covers that they would suit a wide range of readers.

Peter Scott-Howes

Peter Scott-Howes is head of the department of mechanical, production and aeronautical engineering at Farnborough College of Technology, and a member of the BTEC board for engineering.

Business & Technician Education

BOOK REVIEWS

Changing technology

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Volumes one, two and three
by J. B. Pratley

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ISBN 0 273 01970 X

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ISBN 0 333 34027 2

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ISBN 0 09 148911 3

An Introduction to Practical Electronics
by Robert Howlett
TEC/Hutchinson, £5.95
ISBN 0 09 151661 7

Microprocessors: essentials, components and systems
by R. Meadows and A. J. Parsons
Pitman, £6.95
ISBN 0 273 01904 X

If it has achieved nothing else, the Technician Education Council (TEC), recently subsumed within BTEC, has been instrumental in encouraging some of the most relevant and practical re-appraisal of the aims and objectives of technician and technician-engineer education and to re-evaluate the means of achieving these goals. Although in practice lecturers may even now be no able to differentiate between an "aim" and an "objective" than they were when TECSPARK was formulated, 1984 will see the full-scale implementation of a complete spectrum of programmes for engineering technicians and technician-engineers, by both full-time and part-time modes of study, ranging from National Certificate to Higher National Diploma. The essential feature of these courses is that they will have been designed specifically to meet the needs of both industry and the student, rather than being built downwards from the dubious basis of a diluted B.Sc. course.

The combination of broad guidance from TEC, coupled with the vast and varied expertise in syllabus and course design which is resident in colleges and polytechnics, has generated a plethora of programmes purpose-designed to meet specific local and national needs. Few courses are the same but most of a complete spectrum of programmes for engineering technicians and technician-engineers, by both full-time and part-time modes of study, ranging from National Certificate to Higher National Diploma. The essential feature of these courses is that they will have been designed specifically to meet the needs of both industry and the student, rather than being built downwards from the dubious basis of a diluted B.Sc. course.

The combination of the possibly more ephemeral technological studies which are of immediate use, with the underpinning of principles of enduring value provides the structured flexibility which is the sine qua non of present-day technical education. The requirement of an ability to respond rapidly to changes in demand is most clearly evident in the area of electronic engineering and computing technology. Here the pace of change is so rapid that teachers in these areas describe such a circuitous path, with such speed that, without a firm basis of fundamental principles, they would be in danger of disappearing up their own principal: fundamental. Nevertheless, even colleagues in the field of mecha-

nical and production engineering, accustomed as they are to a more measured tempo of scholarship, are already grateful to the inbuilt flexibility of the TEC structure as they find the need to respond to the advent of computer-aided design and manufacture, and robotics.

Although most units relating to rapidly changing technologies or technologies for local industrial needs are devised by staff within the appropriate college (college-devised units), flexibility can all too easily become anarchy. TEC wisely retains a measure of control of both unit of standard and content by a system of near-validation and moderation and by the generation of standard units in those areas of study which are of such general importance and applicability that they are liable to form the core of most programmes within a given area.

It is in these core areas of relatively clear definition and stability that the demand for a clear and authoritative text is greatest, and in the three volumes of his book Pratley sets out to cover the principles fundamental to all electrical and electronic technician work. The three volumes relate to Levels I, II and III of the appropriate TEC standard units and admirably fulfill the author's intention of providing a clear and compact collection of all the essential information to be assimilated by the student at each level, couched with worked examples and graded exercises. Traditionally, in technician courses, a considerable amount of class time has been occupied by the "displacement activity" of note-taking, but with the broader nature of TEC courses creating more pressure on class time, it becomes necessary to consider the desirability of adopting such published study notes.

For the more difficult concepts associated with Higher National Certificate (HNC) work, a more discursive style is appropriate, and in his book Green develops, assuming a knowledge of Level II work, all the principles required to underpin an HNC programme in the area of electrical, electronic and communications engineering. His book is a very easy-to-use and identify particular topics. It covers all the material of the appropriate TEC Level IV standard unit, with the exception of the "displacement activity" of note-taking, but with the broader nature of TEC courses creating more pressure on class time, it becomes necessary to consider the desirability of adopting such published study notes.

There is need for debate as to what constitutes the discipline of modern electronics for technicians. For instance, is the present division between analog and digital electronics artificial and counter-productive or is digital electronics a means to analog ends which will, in future, be specified in analog terms? Such debate has been highlighted by the recent formation of separate boards for engineering and information systems. The very rapid expansion of information technology (IT) with the aid of various government initiatives has made it all the more important that those concerned with the professional practice of electrical and electronic engineering should clearly and vociferously define what they perceive to be their proper sphere of interest and control within the presently amorphous and expanding area of IT.

Despite the fact that these considerations are not addressed, the books by Bishop and Joynton are nevertheless worthwhile. Both authors cover essentially the core analog-electronics material required for National Certificate, as delineated in the TEC Level III electronics standard unit, although Bishop includes a chapter on logic elements and digital logic, which is the practical approach embodied in TEC units. Joynton includes comprehensive manufacturers' data for devices such as BC107/89 transistors and 741 op-amps, whereas Bishop quotes extracts of parameters when appropriate. Although both books are excellent for their intended purpose, I found the style of Joynton clearer and easier to read and applaud his inclusion of a chapter on measurements, a topic

often neglected.

A good example of the TEC system's ability rapidly to embrace new and changing technology is provided by the introduction of a full range of microprocessor standard units as a result of a TEC initiative in 1979 funded by the Department of Trade and Industry and managed on its behalf by the National Computing Centre. Five standard units - microelectronic systems at Levels I, II and III and microprocessor-based systems at Levels IV and V - are now available for technicians and technician-engineers concerned with the design, manufacture and servicing aspects of microprocessor technology; and two further units - microprocessor appreciation at Level III and microprocessor principles at Level IV - have been introduced for those technicians in other disciplines who require a broader understanding of the range and potential of microelectronic devices. These units now form an integral part of many programmes in electrical, electronic and communications engineering. A contributory factor in the speed with which these units have been adopted is the immediate availability of associated learning packages such as the excellent series of textbooks published in association with TEC by Hutchinson, specifically designed for use with the standard units.

Though not part of this series, Kelly's book fully and clearly covers Levels I and II of the TEC standard units, introducing basic ideas of number systems, microprocessor architecture and simple symbolic-relating programming with examples relating to 8080, Z80 and 6502 microprocessors.

Potton's book, part of the Hutchinson series, is intended for students who already have a basic knowledge of the architecture and instruction set of a microprocessor and who wish to extend their understanding of the way they function in systems. The book covers planning, design and fault-finding of microprocessor systems hardware and software, including the use of practical examples and manufacturers' data relating to 8080, Z80 and 6800 microprocessors.

Howlett's book, in the same series, reinforces the knowledge acquired in the study of units at Levels I, II and III by indicating how this can be applied in a hands-on fashion to exercises using the 8085 microprocessor as embodied in the HEKTOR microprocessor evaluation system pioneered by the Open University and now becoming popular for student use in many colleges. Solutions are given to most of the practical exercises but some are sufficiently open-ended to form the basis of student projects.

The books mentioned so far have been specifically written to cover TEC standard units and, in so far as they clearly and concisely cover all the unit objectives at the correct intellectual level with a laudable practical emphasis, all discharge their function admirably. The emphasis in all texts on worked examples and student exercises (many of a multi-choice format) can be recommended as sound. All with solutions is to be applauded. All can be recommended as sound texts.

Meadows and Parsons's book is the only one not written to cover TEC units. Freed from the constraint of having to follow a carefully structured progression of levels through a syllabus of learning objectives, the book ranges freely over the whole subject area of modern digital electronics providing a valuable and refreshing integrated treatment of logic devices and circuits, microprocessors, storage devices and peripherals, concluding with a useful chapter on applications. Though broad in scope, the book achieves a useful depth by avoiding an emphasis on programming aspects. When coupled with an associated volume - Fred Halsall and Paul Lister's *Microprocessor Fundamentals* (Pitman, 1981), much favoured by 8085 users - it provides an excellent accelerated first treatment for all potential microprocessor users.

Tim Whiteley

Tim Whiteley is senior lecturer in electrical engineering at Middlesex Polytechnic, and a member of the BTEC board for engineering.

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BOOK REVIEWS

Hands-on experience

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ISBN 0 340 32154 7

Basic Systems Analysis (second edition)
by Barry S. Lee
Hutchinson, £5.95
ISBN 0 09 154091 7

The Business and Technician Education Council (BTEC) has established a new sector committee in computing and information systems. This committee will be the focus of a number of innovations at technician level which support the country's need to capitalise on information technology. It has a wide remit which includes the overseeing of specialist national awards in the area of computing and information systems, the provision of courses in the continuing/post-experience domains, and the appropriate support to national awards in areas served by BTEC's other committees. This latter duty will become critical to the nation's needs as these committees pursue policies which integrate information technology into their respective courses. The impact will be considerable because it goes well beyond giving students

the use of computer-aided design by technician-engineers or the use of spreadsheet facilities for business procedures.

This is going to create a large range of problems for staff who will need to update their experiences so that they are familiar with current practices in business or engineering or the office. Colleges will need to provide adequate equipment with appropriate software supported by proper technical staff. How many colleges have adequate word processing facilities so that all their students can get hands-on experience? How many have access to a sensible database so that students can retrieve information as part of a case-study? Such a system will need maintenance using technical support staff so that the relevance of the database is maintained, giving students a real feeling for the speed and immediacy of information retrieval.

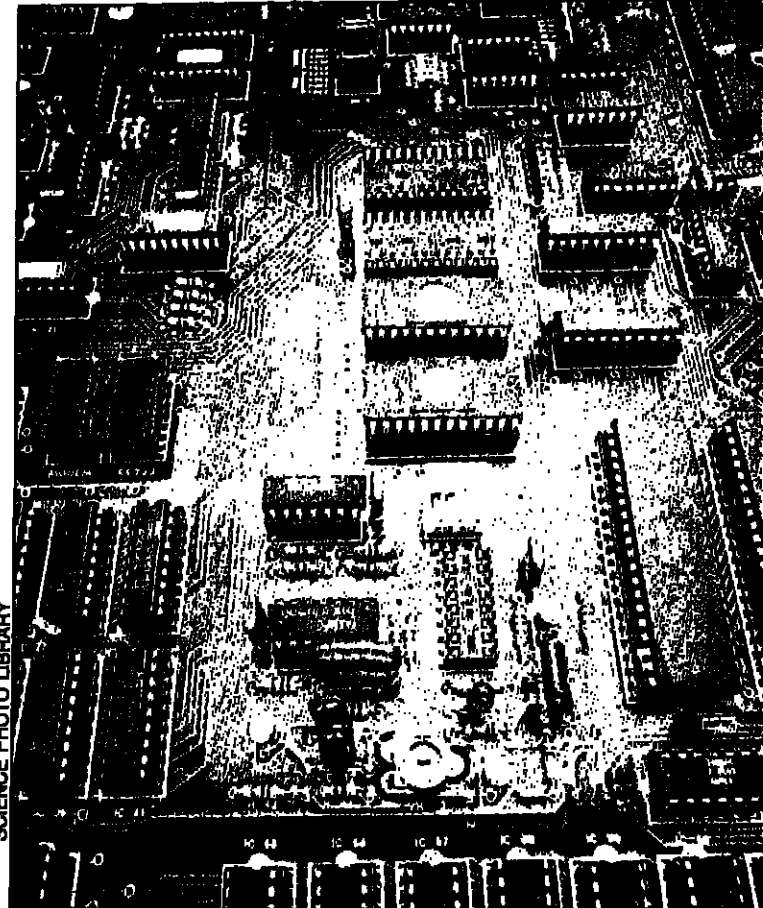
It will also mean that new teaching techniques will need to be established and supported by new texts. It is not enough to give students a thumbnail sketch of the computer and then present a trivial basic program which represents a caricature of reality, as is done in chapter nine of Perkes's book. Although such texts do help with the present syllabus, they are dated and fail to prepare students for today's world let alone tomorrow's. Most business or engineering technicians should see the computer as a tool and should be given a firm conceptual basis for its use in this way. This presents a need for realistic educational software in this field, and such software is indeed sold with some texts - for example, a data processing case-study with *Computing Case-studies: computers in health services* edited by D. Hill (Harrop, March, 1984). Not much educational software exists because the system has been hypnotized by "basic programming" which often results in convincing technicians that computers cannot be any use because they are so difficult to use. At the end of one such course a young lady declared "It has taken me two years to get a program to work to solve a problem I could already solve!"

A better approach to information systems is presented in David Harrison's book. However, although he firmly adheres to the need to do things, unfortunately most of his doing is without software and hardware. If the teacher can provide the necessary hands-on experience to back it up, then this text will provide good support. It is, however, rather blinkered and does not reflect the full scope of information technology. Word processing gets a page and punched cards get four pages. However, he does not spend page after page instructing you how to program in Basic rather badly, as Perkes does. (A teachers' book is available at £4.95 and a software package should be available later this month at £19.95.) If you need to learn to program, use books designed to teach you how to do it properly like Andrew Parkin's *COBOL for Students* (Edward Arnold, 1982) and if for

Arnold, 1983) or better still the same author's *Software Engineering for Small Computers* (Edward Arnold, 1982).

The really practical approach is adopted by Jackie Chaudhury and Lyn Agle whose text is designed for BTEC General students. Although it does not actually supply software, it leads the teacher to feel that this is really needed to complete the experience. Indeed, the chapter on word processing assumes it is available and expects the reader to "do it". This mirrors the approach of Skinner and Prentice, whose text is focused on word processing and provides an excellent "learning by doing" course. It is slightly spoilt by trying to cram a few things like a program, software package and a spreadsheet into ten pages at the end. Why not write three more texts like this on each topic?

One of the other irritating features of some of the texts mentioned so far is



the inclusion of glossaries that seem to ignore the efforts of the British Computer Society which, with the collaboration of Examination Boards, has produced a glossary for low-level courses (*BCS Glossary*, 50 pence). Few of the texts already mentioned are suitable for "continuing education", for they need to assume a mature reader who will desire a text which gets to grips with the new technology as quickly as possible. The danger is that such a presentation progresses too quickly, thus ignoring the psychological difficulties. What

component with time for the concepts to consolidate. Given this, Skinner and Prentice's book could be used in such a course. In a similar sense Barry Lee's book would form an excellent core text around which to design a course for updating management. There is slightly more experience at this level, particularly in providing post-experience conversion courses which give entry to the computing profession to those with previous business experience. Books used in such courses would include Andrew Parkin's *Systems Analysis* (Edward

Arnold, 1983) or better still the same author's *Software Engineering for Small Computers* (Edward Arnold, 1982).

Science options

Physics for TEC Level II
by T. L. Lowe, K. Roe, G. D. Redford, D. T. Rees and A. Greer
Stanley Thomas, £5.95
ISBN 0 85950 313 1

Essential Physics
by L. Kirkup, A. J. Murkott, M. C. Roe and S. D. Vaisey
Pitman, £6.50
ISBN 0 273 01896 5

Inorganic Chemistry for Higher Education
by J. Brockington and P. J. Stamper
Longman, £6.95
ISBN 0 582 41232 3

The declared aim of Business and Technician Education Council (BTEC) courses is to help prepare students for work and to provide a worthwhile educational experience. Indeed, in the science sector of BTEC most of the courses are broadly vocational. Though numerically small, the science sector has the highest proportion of students studying at the higher levels (Higher Certificate and Higher Diploma), with a long tradition of a high proportion (approximately 60 per cent) of students going on to degree and professional qualifications. At certificate level, the sector is unique within the former TEC programme areas in having an integrated scheme covering the biological and physical sciences together with some mathematical sciences. The awards at this lower level are actually certificates and diplomas in science.

Courses must be designed to cope with a fairly wide range of abilities while keeping options open. The major problems of the teacher are motivating the students, relating the courses to employment, giving good basic groundings in the subjects and making the students aware of what might lie beyond the immediate horizon. The nature and quality of the teaching methods used is crucial to the

degree of attainment by the students of the objectives of the courses. In particular the source material that the student will use in his own time (and at his own pace) must be of the right type and standard.

The Technology Today series published by Stanley Thomas is an attempt at meeting the needs of technicians studying for certificates and diplomas in the physical sciences and engineering fields. For example, *Physics for TEC Level II* by Lowe *et al.* has been identified with TEC standard units U76/003 and U81/846. However, although its coverage of basic principles is sound and the presentation is good, the book has little to do with applications or with the actual work experience of the technicians for whom it is meant. As such, it will not provide the inspiration which is so vital in maintaining student motivation. The book is devoted to a very well defined part of a course with a well defined content. Is it a wise teaching strategy to suggest implicitly or explicitly that science is compartmentalized? Furthermore, students studying physics at Level II might feel that success is assured if this is used in preference to other books covering (among other things) the same material. Such close ties between book and syllabus is not conducive to the opening of doors to further study and achievement. One not inconsiderable factor is that a student who is studying a programme containing 10 to 20 units is unlikely to purchase one book for each unit.

Again, although the sentiments expressed in the introduction to *Essential Physics* by Kirkup *et al.* are excellent, the good intentions do not materialize in the text. In this case, however, there is a greater attempt to inspire by dealing with things from the real world. Opportunities have nevertheless been missed: in the section dealing with heat, for example, where a problem deals with double glazing, how much more motivating might it have been if the student had been encouraged to consider the energy situation in his own place of work or at home and consider ways of saving energy. The book does, however, have the merit of covering a reasonably wide area within

ment (Edward Arnold, 1980) and David Howe's *Data Analysis for Data Base Design* (Edward Arnold, 1983).

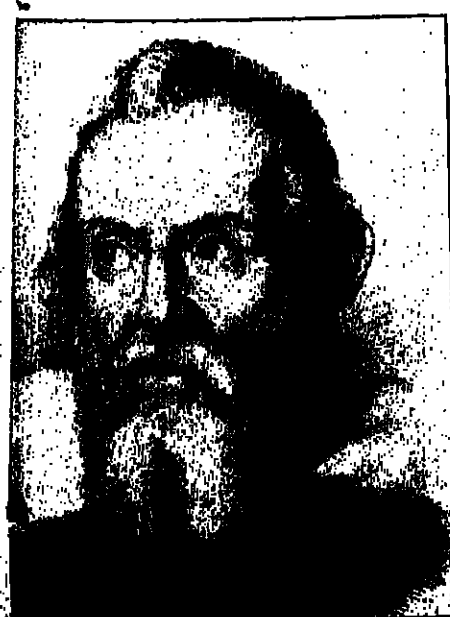
One of the immediate tasks for the new BTEC sector committee is the maintenance of the National awards and the Higher National awards in computer studies and in mathematics, statistics and computing. Although some of these awards are well recognized by employers, they will need to be kept up to date to match the rapid evolution taking place in business and industry. With this in mind, a revised version of the HND in computer studies is nearing completion. This will, I believe, recognize the need to specify separate core requirements for business and industrial applications. The present highly successful business-oriented HND has met the widespread needs for staff in the commercial and business fields. Colleges offering the courses reflect a wide range of emphasis - from large data processing systems to small business organizations. Barry Lee's book would be an excellent text for such courses, as it reflects a practical approach to systems analysis and presents a good range of exercises (with outline solutions).

Indeed, all the texts in the Hutchinson computer studies series are worth considering, as they are aimed as support for the education of the business computer technician. In these courses the programming skills of the technicians are rapidly developed so the courses embody a great deal of hands-on activity. This normally ranges from terminals to mainframes, microcomputers through batch processing, language systems, database systems and word processing. With the introduction of industrial data processing, however, there will be more emphasis on real-time programming and microprocessors, and this should mean a wider range of hardware and texts - for example, P. J. Thewils and B. N. Foxon's *From Logic to Computers* (Blackwell Scientific, 1983).

Donald Conway

Donald Conway is head of the school of mathematics, statistics and computing at Lancaster Polytechnic.

Integral part of the scientific movement



90 controversies at two levels



The Newtonian philosophical change

(1751) and numerous articles by various authors in the *Encyclopédie*; by Jean-Etienne Montucla's magisterial *Histoire des mathématiques* (1758); by Jean-Sylvain Bailly's beguiling volumes on the history of ancient, modern and oriental astronomy (1775-87); and by the end of the century by a flood of specialized histories of all the main sciences and arts of Europe with some discussion also of those elsewhere.

French philosophical historians in the eighteenth century thus integrated the philosophical history of science into the general intellectual culture of Europe and into its historical consciousness both of itself and of its context in the wider world.

The history of science became at the same time less programmatically and more factually part of the professional historiographical movement. The historical school at Göttingen above all set out to apply the established methods of classical and biblical philology and diplomatic to produce a general history of human experience, which would display "the connectedness of the materials of world history", including in its ample vision the history of governments and religions, of the arts and sciences, and so on.

It was a vision and a strategy that came to be distorted, narrowed and clouded during the nineteenth century by the rise to academic dominance of political and constitutional historians who separated what they called history from its context in all other aspects of human experience. In these circumstances the history of science, art, philosophy, religion and of thought in general came to be treated as merely specialist interest.

The eighteenth century conception of the history of mankind as essentially the history of intellectual culture, despite the diverse forms given it by Italian, French, Scottish and German thinkers, was no doubt too simple. We may wish to envisage the history of mankind more empirically as the history of the beliefs, memories, habits, dispositions, actions and so forth of men and women in societies, and circumstances of their life, and of the most characteristically human and logical for example has promoted a fresh look into the intellectual contexts in which it can be seen that concepts of probability have been in substantial use, notably in medicine, law and moral philosophy, and from antiquity.

The dramatic irrationalism of our time has likewise sensitized us to the irrational person and the study of this has offered historical insights valuable in themselves even if doubtfully relevant to the scientific movement. Again our contemporary experience of the relativity of beliefs and values has emphasized the differences in expectation and behaviour among different societies and cultures, as opposed to an enduring rationalism. Yet new insights from our own experience affect the questions we put in a comparative historical anthropology, the basic rationality of our treatment of them remains essentially stable.

If each generation in dismantling the history written by its predecessors in their image then rewrites it in its own, we are committed by the whole critical process of scholarship to distinguish evidence from interpretation.

The questions may also change with the intentions of the questioner and with the subject matter. Historians, trying to enter into the mind of their subjects, in order to grasp their problems and expectations in the uncertainty of an unknown future, put their questions to the sources with a different intention from a philosopher looking in the historical materials for constants of scientific thought or of individual or social behaviour. Such an inquiry can illuminate historical analysis by enabling us to distinguish the historically accidental from the logically essential elements in the succession of scientific systems.

An analysis of the history of scientific thought must inevitably involve an analysis not only of how the scientific problems presented themselves at a given time but also of the validity of their solutions in the face of nature.

A knowledge of the whole development of the intellectual tradition of natural science, mathematics, logic and philosophy then enables the historian to see the problems and intellectual manoeuvres of Archimedes or of Galileo or Descartes or of Darwin in a field of possibilities vastly more extensive than was visible to those thinkers themselves, and to form an appreciation of their achievements and limitations from the wider point of view offered by subsequent knowledge and technique. Provided that their distinctive goals are clearly recognized, historical and logical analysis can each illuminate the other.

stitutional law.

The requirements of technical competence both scientific and linguistic, and of historical sensitivity and competence of many kinds, apply equally to the classical history of scientific thought and to the programmes recently promoted in the diverse schemata of philosophers; to the vagaries of French structuralists; to the ascriptive prescriptions derived largely in the Anglo-Saxon world from sociology; to the naively parochial dogmatism of the neopositivist, no Marxist persuasion, and to presentations of history arising out of any other ideology.

The test is not prescription, whatever its pretensions, but performance in true and sensible scholarship. To see the history of science, medicine and technology through the eyes of political interest or popular belief is to classify it contrary to the essential nature of its subject matter. To see it as a programme calculated for political effect is to classify it outside scholarship altogether.

The questions put to the sources may change with knowledge and viewpoint as one questioning present is succeeded by another. Each may offer fresh insights.

We are alerted to the past by experience of the present. Medieval and early modern Europeans set out to recover the sources of ancient thought first because these provided the essential materials for their own treatment of scientific and philosophical problems and because the ancient experience seemed to offer a guide for their own intellectual development. Historical interest then came to focus on those aspects of earlier science that fitted most naturally into the sequence of solutions of problems that generated the accepted body of current scientific knowledge.

During the eighteenth and nineteenth centuries progress in the present directed attention to progress in the past and to the conditions that made it possible. New contemporary experiences in our century as earlier have brought into focus historical inquiry and logic for example has promoted a fresh look into the intellectual contexts in which it can be seen that concepts of probability have been in substantial use, notably in medicine, law and moral philosophy, and from antiquity.

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Some perceptions into the history of scientific thought have been made possible only by more recent mathematical or scientific knowledge. There are fruitful possibilities likewise, for example, in an association between the history of technologies and quantitative analysis of their use and economic effect.

Always it is essential to be clear about the differences between these enterprises. What can be achieved is to take consciously into account the fact that the presuppositions, interests and techniques of historians themselves change with the development of these parallel analytical disciplines and so bring about the changing view of the past that is so obvious in the history of historical scholarship.

Again we must distinguish what is common from what is different in the histories of scientific thought and of the practical arts. Theoretical sciences and the practical arts have had close and fruitful relations since antiquity and it would impoverish our historical understanding to envisage the one without the other.

Optics and painting, acoustics and music, mechanics and engineering, physiology and medicine for example have shared each with the other in various ways a common social as well as scientific history, common problems, and often a common intellectual style. But even with much in common science and art have different ends.

Analytical science as a theoretical inquiry has understanding and explanation as its end. Having taken its subject matter to pieces and identified its parts, and having understood how they fit together, it seeks to reconstruct, as of the visual and musical arts and of engineering and practical morality and politics, is not the analysis of the parts but the effect produced in the whole. The effect is not by medicine is health, by engineering is a mental well-being of the unique individual person. It shares this end rather with religion than with science.

Where medicine differs from religion and belongs with science is in its means. Hence the complexity of relating the intellectual and moral history, and the philosophical anthropology, of medicine and science.

Can historiography be true? Could history be written without a selective vision of events and their relations any more than natural science could proceed without theory? But then is historiography more like a work of literature, an aesthetic or dramatic pattern, than an exercise in the logical control essential to natural science?

The art that from antiquity has distinguished history from fiction has been the control of vision by evidence and the distinction by critical scholarship of evidence from interpretation. Shakespeare in his analysis of human character offered generalizations which we recognize at once as true, but our enlightenment from literature comes from applying the analysis of an imaginary world to our experience of the real one. Historiography is an art committed to searching for the real and particular truth.

Politicized historiography by contrast is a known form of the art of fiction in the guise of truth, which in long tradition has aimed not at truth but at effect. Its objective has been not to discover and understand what has happened in fact, but to present an account of events to promote or justify political action.

It aims then by the distortion or suppression of evidence or by rhetorical devices of deception to promote a party line, or perhaps to promote authors themselves, by exploiting the trust upon which a true republic of letters must rest.

The author is a quondam fellow of Trinity College, Oxford. This article is the full text of the introduction from the *Chair de la Collège: Histoire des idées: Histoire des Méthodes: à la recherche d'un troisième terme*, held at the University of Oxford in September 1983.

Source: *Journal of the American Statistical Association*, 1990, 85, 103-113.

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Lecturer in Psychology - P181010/84

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Applications, which will be treated as strictly confidential, should include a full curriculum vitae, a recent small photograph and the name and address of referees, and should be forwarded to the Deputy Registrar (Staffing), University of Papua New Guinea, PO Box 320, UNIVERSITY PAPER NEW GUINEA, Port Moresby. To be considered for appointment, candidates must be able to reach Port Moresby by 1st March, 1984. Candidates resident in the UK should send an additional copy to the Association of Commonwealth Universities (ACU), 38 Gordon Square, London WC1H 0PF, from whom further general information is available. 14/03/84

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UNIVERSITY OF STRATHCLYDE DEPARTMENT OF ENGLISH STUDIES

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UNIVERSITY OF STRATHCLYDE DEPARTMENT OF ARCHITECTURE AND BUILDING SCIENCE LECTURESHIP

Applications are invited for a Lectureship in the Department of Architecture and Building Science tenable from 1st October 1984. Candidates, who should be qualified to teach in the field of architecture, building construction, building economics, building materials, environmental physics. Salary scale £7,190 to £14,125 per annum. USS benefit. Application forms and further particulars (Ref: 84) are available from the Academic Staff Office, McCance Building, 16 Richmond Street, Glasgow G1 1XQ. Closing date for applications: 20th March 1984. 14/03/84

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Universities continued

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Salary will be in the range from £7,190 to £14,125. Further particulars and application forms are available from the Academic Staff Office, The Registry, The University of Kent at Canterbury, Canterbury, CT2 7NF, on the envelope. The closing date for the receipt of completed applications is Friday, March 30th 1984. HT

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University of Glasgow Department of Accountancy LECTURESHIP IN INFORMATION SYSTEMS

Applications are invited for the post of Lecturer in the Department of Accountancy. The successful candidate will be expected to lead in research and teaching in the field of information systems. Applications are invited from suitably qualified persons. 14/03/84

Salary will be in the range from £7,190 to £14,125. Further particulars and application forms are available from the Academic Staff Office, The Registry, The University of Glasgow, Glasgow G12 8QQ, on the envelope. The closing date for the receipt of completed applications is Friday, March 30th 1984. HT

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Royal Military College of Science

A range of new University Appointments

The Royal Military College of Science, Shrivenham, Oxfordshire, provides a range of undergraduate, postgraduate and post experience courses for mainly army personnel, and also supports an active research programme. From 1st August Cranfield Institute of Technology, a national centre for advanced teaching in technology and management and in applied research & development, will be taking over the civilian teaching and research activities at the college, and wishes to make the following key appointments.

Professor of Computing Science

to lead the Computing Science Group and to be responsible for providing courses in computer science and systems design at postgraduate, undergraduate and other technical post-experience levels, some of an experimental nature. The professor will also be expected to develop computing science at RMCS to meet the growing needs of the defence services and industries.

The College has extensive VAX computing facilities, fuller details of which are described under 'Head of the Computer Centre' below. Closing date 23rd March. Ref. A/1.

Head of the Computer Centre

to be responsible for the day to day management of the Computer Centre and for the provision of an efficiently run network of computer systems which is able to respond to diverse user needs. Applicants should possess a good degree in some aspects of information technology, and have proven management experience coupled with a broad knowledge of the essential computer service will be based on a network of VAX/VMS systems. It will be used by many departments and the languages will include FORTRAN, PASCAL, BASIC, C and CORAL. The software packages are PAFC, SCICONIC, NAG and GINO and more are expected to come on stream shortly. Closing date 23rd March. Ref. A/2.

Lecturers/Senior Lecturers Mechanical & Civil Engineering & Aerodynamics

- Dynamics of mechanical systems with particular application to automatic handling, power hydraulics and robotics. Closing date 6th April. Ref. A/4.
- Stress analysis and structures, with particular application of finite element analysis. Closing date 6th April. Ref. A/5.
- Aerodynamics with particular reference to both fixed and rotary wing aircraft. Closing date 23rd March. Ref. A/6.
- Fluid mechanics and hydraulics. Closing date 6th April. Ref. A/7.
- Civil Engineering, Materials and Construction Technology with particular application to roads and airfields. Closing date 6th April. Ref. A/8.

Candidates should have a good degree in Engineering appropriate experience - preferably industrial; 'unentered' Engineering status or the likelihood of obtaining this status in the near future. Salary scales: £7,190 to £14,125 or £13,515 to £16,925.

Senior Research Officer Materials Technology

required to lead the research team. Main areas of research interest are high rate deformation, thermomechanical treatment, and structural materials for defence applications. Duties include initiating and progressing research projects, planning research activities, budgeting and supervising student research projects. Salary scale: £10,710 to £14,125. Closing date 20th April. Ref. A/16.

Electronics & Electrical Engineering

- electronic engineering including AF and RF electronics and microwaves; Ref. A/9.
- digital systems engineering; including communications, software engineering and micro-electronics; Ref. A/10.
- electro-magnetic systems engineering, including guidance and radar; Ref. A/11.
- power electronics; including electrical drive, control and instrumentation; Ref. A/12.

ACTION

For all appointments, application forms and further details are available from Personnel Department, Cranfield Institute of Technology, Cranfield, Bedford MK43 0AL. Telephone Bedford 750111, ext. 3327. Completed forms to be returned by the date shown. Please quote the appropriate reference number.

Polytechnics continued

GLASGOW SCHOOL OF ART
MACKINTOSH SCHOOL OF ARCHITECTURE

- Are you a Designer?
- Are you Young and Enthusiastic?
- Do you think you could teach Environmental Science and Design in a leading School of Architecture?

There is a vacancy for you here on a two year contract. An interest in computing would increase our interest in you.

Our Architecture courses are a joint venture with the University of Glasgow.

SJNC Salary Scale - Lecturer A £8,313-£13,125 per annum.

Further particulars and application forms (which should be returned by Friday, 16th March 1984) from: Secretary and Treasurer, Glasgow School of Art, 167 Renfrew Street, Glasgow G3 6RO

(14300)

Sunderland Polytechnic
Faculty of Engineering

Department of Electrical, Electronic and Control Engineering

RESEARCH ASSISTANT (MACHINE VISION)

Salary: £4,047-£5,649

Applications are invited from graduates with a good honours degree in Electrical or Electronic Engineering or Computer Science (with hardware experience). The aim of the research is to develop low cost vision systems, suitable for implementation alongside flexible manufacturing systems. The project involves the design, development and testing of a computer vision system for the detection of defects on printed circuit boards. The work will involve both circuit design and computer programming. Ideally applicants should have some experience of both these areas.

For further details contact Mr A. E. Adams, Tel: (0783) 76111 ext. 19. Application forms may be obtained from: Mr A. E. Adams, Sunderland Polytechnic, 10th Floor, Ryburn Road, Sunderland S6 6JL. Tel: (0783) 76111 ext. 11.

Closing date: 21st March 1984.

The Polytechnic
Wolverhampton

ENGINEERING

Computer-aided engineering, including design, analysis, and their development and implementation of CAE methods. Details and application forms from: The Polytechnic, Wolverhampton (WV6) 9JH. Tel: (0902) 11664 (enquiries) H2

We offer a range of courses abroad in Japan and the USA. Details and application forms from: The Polytechnic, Wolverhampton (WV6) 9JH. Tel: (0902) 11664 (enquiries) H2

LOVELY FLAT overlooking park in N. London to let. 6 rooms, 6th floor, 1964. H24

Miscellaneous

CITY OF SHEFFIELD WOMEN'S TECHNOLOGY TRAINING WORKSHOP

Sheffield City Council Employment Department has set up a Training Company to sponsor and oversee new developments in the field of training in the City.

The first project is the Women's Technology Training Workshop offering training in micro-electronics and computing to women over the age of 26. The workshop caters specifically for the needs of women who have never worked, who wish to return to work after raising a family, who are unemployed or at risk of becoming unemployed. There will be no formal entry requirements for child care experience.

We wish to provide support, encouragement and good quality instruction in a co-operative atmosphere. We have received designation for exemption from the Sex Discrimination Act, in order to take such positive action in training.

The Workshop will open to trainees in March 1984.

To complete the term of eight staff, we still need:-

ELECTRONICS TUTOR £9,363 p.a.

To work with small groups of women to provide education and training in the following areas:- basic electronics, electronic assembly, and maintenance, testing of assemblies, design of devices and circuits, digital electronics and micro-processor programming.

Women who wish to apply should have an upper second class honours degree and experience of modern micro-electronic devices including digital circuits and micro-processor programming. The successful candidate will be responsible for the design, development and testing of electronic assemblies and for the supervision of students.

Application forms and further details from: CO-ORDINATOR, WOMEN'S TECHNOLOGY TRAINING WORKSHOP, THE TECH THOMAS STREET, SHEFFIELD S1 4LE. Tel: (0114) 250001. Closing date: 31st March.

Colleges of Technology

Metropolitan Borough of Stockport
STOCKPORT COLLEGE
OF TECHNOLOGY

VICE PRINCIPAL

(Group 9)

Applications are invited from suitably qualified and experienced persons for the post of Vice Principal of this large college which will become vacant on 1st September, 1984, on the retirement of the present holder.

Application forms and further details may be obtained from:

The Principal,
Stockport College of Technology,
Wellington Road South,
Stockport SK1 3UQ.
Tel: 061-480 7331.

to whom completed applications must be returned by the closing date, 21st March, 1984.

(14286)

Colleges of FE

LECTURER II/SENIOR LECTURER IN INDUSTRIAL MEASUREMENT AND INSTRUMENTATION

(Post ref: ST/0023)

You should be a graduate (or equivalent) in an appropriate discipline and have considerable recent experience in measurement and instrumentation. You will be familiar with micro-processor/computer methods of process control. In addition to traditional control

desirable for the post and you should preferably be a teacher trained.

Salary: £7,215-£12,562 Bar - £13,443.

Application form and further details are available from: Alan Hodgson, Staffing Officer, Bradford & Ilkley Community College, Great Horton Road, Bradford BD7 1AY. Closing date: 12th March, 1984.

(14282)

Taking up the challenge of tomorrow today!
Bradford & Ilkley
COMMUNITY COLLEGE

EAST HERTS COLLEGE, TURNFORD PRINCIPAL

Applications are invited for the post of Principal of this Group B College. The present Principal Mr L. K. Street, will be retiring at the end of August, and it is hoped that the successful candidate will be able to take up the appointment in September 1984.

The College is situated in modern buildings on a pleasant 23 acre site at Turnford which is between Broxbourne and Chesham on the A1170 close to the new A10, and approximately 16 miles from London. It provides a very wide range of courses to meet the needs of local industry and commerce and is the centre for social, cultural and recreational activities in the area.

Applications, by letter should be submitted by 23 March to the County Education Officer (Ref: GHM), County Hall, Hatfield, SG13 8DF, from whom further particulars are available.

(14288)

Hertfordshire
County Council

SULTANATE OF OMAN ROYAL GUARD BOYS TECHNICAL SCHOOL New Appointments for September 1984

Post 1 - Light Craft (Combined Materials)

Post 2 - General Science

Post 3 - Engineering Science

The posts commence 1st September 1984 and are initially for two years. Contracts are renewable by agreement.

Candidates must be male UK citizens with a British educational background. A minimum of four years teaching experience is required, and qualified teachers are preferred.

Posts 1 and 3 require relevant experience in middle or secondary schools. Post 2 requires an appropriate engineering or science qualification and industrial experience.

Salary: R.O. 500-620 per month (paid in Riyals Omani free of local tax, A.R.O. 0.500 = £1 is equivalent to £12,000-£14,880).

Bradford & Ilkley Community College is co-ordinating these appointments on behalf of the Royal Guard Boys Technical School. The School is residential and currently accommodates 160 pupils in classes from Year 1 (10-12 years) to Year 8 (18-20 years).

Application forms and further details are available from:-

A.W. Hodgson, Staffing Officer,
Bradford & Ilkley Community College,
Great Horton Road, BRADFORD BD7 1AY.
Closing date: 21st March 1984

Administration

THE LONDON SCHOOL OF ECONOMICS AND POLITICAL SCIENCE Finance Officer

The School is seeking to appoint a Finance Officer. Following re-organisation of the School's administrative structure the Finance Officer will be one of three senior officers reporting to the Secretary, who has responsibility for the Director for the administration of the School. The Finance Officer will advise on financial planning and will be responsible for budgeting and financial control, for management accounting and information, the continued development of financial computer systems and the day-to-day management of the financial division of the School's administration. Candidates should be professionally qualified with broad financial experience and an interest in pursuing their career in a stimulating general administration of the School. It is hoped that the successful candidate will play a full part in the general administration of the School. It is hoped that the successful candidate will be able to take up appointment by 1st October, 1984.

Salary will be within the Grade IV range of the salary structure for administrative staff in universities (professional equivalent range).

Further particulars of the appointment and application forms are available from the Secretary, London School of Economics and Political Science, Houghton Street, London WC2A 2AE. Closing date for applications: 26th March, 1984.

(14286)

Committee of Vice-Chancellors and Principals of the Universities of the United Kingdom Re-advertisement

Applications are invited from graduates for the post of ADMINISTRATIVE ASSISTANT in the secretariat of the Committee of Vice-Chancellors and Principals which is concerned with a wide range of matters affecting the general and administrative affairs of universities. Preference will be given to younger candidates with appropriate work experience who have proven ability to draft policy papers and assess numerical data.

Initial salary according to experience in the administrative scale grade 1A (£5,210 p.a. to £11,016 p.a.) plus a London Allowance. Superannuation under USSA 1979. The appointment will be subject to a probationary period of two years and is to be taken up as soon as possible.

Further particulars may be obtained from Mr T. S. Rawlinson, Senior Administrative Officer, 28 Tavistock Square, London WC1H 9EZ, to whom applications should be sent not later than 30th March 1984.

(14288)

Secondary Education

HARROW SCHOOL Head of Computing

We are looking for someone for September 1984 to direct the use of computers at Harrow. At present our thirty computers are in use. Computer Scholarships are offered and Prizes awarded annually. The appointed person would lead the team already teaching, have the opportunity to create his own software and lead pupils in project work within and outside the school. This is an exciting opportunity for the right person to make their name in this important field. Accommodation is available and Harrow has its own salary scale.

Applications to The Head Master, Harrow on the Hill, Middlesex with full curriculum vitae and names of referees.

(14302)

Harrow School : COMPUTER STUDIES

Opportunity for September 1984 for teacher with ideas and enthusiasm to join a team working on the use of computers at Harrow. This is an exciting opportunity for the right person to make their name in this important field. Accommodation is available and Harrow has its own salary scale. Applications to The Head Master, Harrow on the Hill, Middlesex with full curriculum vitae and names of referees.

For further details and application forms, please write to: The Head Master, Harrow School, Harrow on the Hill, Middlesex HA1 3BU. Closing date - 10th April 1984.

Research & Studentships

POSTGRADUATE AWARDS ACADEMIC YEAR 1984/85 STUDENTSHIPS

The Department of Education for Northern Ireland (DENI) is offering a limited number of awards for full-time research training and research related to industry and for approved full-time postgraduate research in the following areas: HUMANITIES, SCIENCE AND TECHNOLOGY, INFORMATION TECHNOLOGY, SOCIAL SCIENCES AND NATURAL ENVIRONMENTAL STUDIES.

Normally, applicants should be ordinarily resident in Northern Ireland and hold or hope to obtain at least an upper second class honours degree.

BURSARIES DENI is also offering some awards for approved full-time postgraduate courses (excluding teacher training) which lead to Certificates or Diplomas. Applicants should normally be ordinarily resident in Northern Ireland and hold or hope to obtain at least a pass degree or equivalent qualification.

HOW TO APPLY For courses in Northern Ireland, apply first of all to the institution for a quota place. The institution will provide grant application forms to DENI but offered quota places. DO NOT send completed forms direct to DENI but return them to the institution's academic department by its closing date. For courses outside Northern Ireland, ask DENI for a grant application form. Return the completed form direct to DENI. THE CLOSING DATE FOR SUBMISSION IS 1 MAY 1984. You should submit the form in anticipation of degree results or firm offer of a place, if necessary.

Further details from: POSTGRADUATE AWARDS BRANCH DEPARTMENT OF EDUCATION FOR NORTHERN IRELAND RATHGALL HOUSE BALLOO BANGOR CO DOWN BT9 5PR

TELEPHONE: BANGOR 66311 EXT 439

SPECIAL NOTE Persons ordinarily resident in Northern Ireland are not eligible for postgraduate awards from award-making bodies in Great Britain. Awards for postgraduate teacher training are NOT available under these schemes.

(14286)

University of Liverpool Department of Child Health and the School of Physical Education

PART-TIME RESEARCH ASSOCIATE

Applications are requested urgently from suitably qualified persons for a research project into the effect of composition, cardio-respiratory efficiency and hormonal profile of obese children.

The project will require working for three days per week over a seven month period or for two days per week over a longer period.

Further particulars of the project and the salary scale may be obtained from the Director of the University of Liverpool, School of Physical Education, 10th Floor, 10th Avenue, Liverpool L69 3GB. Applications should be sent to the Director by 30th March 1984.

(14288)

University of Newcastle Upon Tyne The Department of Law and Economics

POSTGRADUATE STUDENTSHIPS IN LAW AND ECONOMICS OCTOBER 1984

Applications are invited from suitably qualified persons for a research project into the effect of composition, cardio-respiratory efficiency and hormonal profile of obese children.

The project will require working for three days per week over a seven month period or for two days per week over a longer period.

Further particulars of the project and the salary scale may be obtained from the Director of the University of Newcastle Upon Tyne, School of Law and Economics, 10th Floor, 10th Avenue, Newcastle Upon Tyne NE1 7RU. Applications should be sent to the Director by 30th March 1984.

(14288)

(Chelsea College) Centre for Science and Mathematics Education RESEARCH OPPORTUNITIES

The Centre for Science and Mathematics Education is seeking applications from well-qualified persons who wish to carry out research in any of the areas of interest listed below. These include assessment, health education, learning, computer assisted learning, health education, curriculum studies, school and curriculum policy, educational technology and differences in education.

Suitably qualified candidates may be nominated for full time research studentships and the Centre also offers part time research studentships linked to Research for the Degree of MPhil and PhD. Candidates may also be nominated for a part-time research studentship linked to a full-time research studentship. The Centre also offers a full-time research studentship in the area of health education, curriculum studies, school and curriculum policy, educational technology and differences in education.

For further details, please write to the Administrative Secretary, Centre for Science and Mathematics Education, Chelsea College, Royal College of Art, Chelsea, London SW3 3LH. Tel: 01-756 3401.

Colleges of FE continued

St. Aldates College HOLIDAY COURSE TUTORS

We are looking for tutors already working in existing courses of study from undergraduate to postgraduate levels to teach short vacation courses to students, from USA Universities in Oxford, between the end of June and the beginning of September.

Duration of the course would be flexible, between 4 and 8 weeks. The content level should be suitable for undergraduate students in American Universities.

We can offer excellent accommodation conditions, facilities and high rates of pay.

Please write to Box No. 0144 with a full C.V. of career history and an outline of the course offered together with any other relevant information.

Please send all Box No. replies to Mr. R. H. Stoddart, St. Aldates College, 100 Broad Street, Oxford, OX1 1JF.

Courses

THE CITY UNIVERSITY BUSINESS SCHOOL

One year intensive MBA Courses in:

- Finance
- Marketing
- Export Management and International Business
- Industrial Relations and Personnel Management

Plus an MSc degree in Business Systems Analysis and Design.

*Part time courses (2 years) are also available.

Applicants must possess either a first or second class honours degree, or an equivalent professional qualification and will normally be required to take a pre-admission test.

The course begins in October 1984. For more information please contact the Admissions Office.

Telephone: 01-920 0111 Ext. 434

Overseas

NATIONAL UNIVERSITY OF SINGAPORE Department of Philosophy

Applications are invited for a teaching appointment in the Department of Philosophy from candidates who should have a PhD degree and who specialise in Chinese Philosophy, Taoism, Buddhism and Mohism as well as one other course in Western Philosophy.

The appointment will be tenable for a period up to three years. Annual gross emoluments will normally range from \$22,540 to \$31,090. (S\$1 = S\$3.05 approx).

The salary that will be paid will depend on the successful candidate's qualifications, experience, the level of appointment offered and any emoluments the candidate may receive from his home university during the appointment.

Leave and medical benefits are provided. Under the University's Academic Staff Provident Fund Scheme, the staff member and the University are each required to contribute at the present rate of 25% of his salary, the staff member's contribution being subject to a maximum of \$3920 a month. The sum standing to the staff member's credit in the Fund may be withdrawn when the staff member leaves Singapore/Malaysia permanently. Other benefits include a retelling-in allowance of \$31,000 or \$32,000, subsidised housing at rentals ranging from \$1100 to \$2216 p.m., education allowance in respect of children's education subject to a maximum of \$12,000 p.a., passage assistance and baggage allowance for the transportation of personal effects to Singapore. Staff members may undertake consultation work, subject to the approval of the University, and retain fees up to the equivalent of 60% of annual gross salary in any one year.

Application form and further information on terms of appointment may be obtained from:

The Director
Personal Department
National University of Singapore
Kent Ridge
Singapore 0511

NUS Overseas Office
6 Chesham Street
London SW1
United Kingdom
Tel: 01-235 4562

(14282)

MITCHELL COLLEGE OF ADVANCED EDUCATION AUSTRALIA

Mitchell College is located at BATHURST, a city of 25,000 people, 130 miles west of Sydney. It is a multi-disciplinary institution offering over 40 courses of study from undergraduate to postgraduate levels to approximately 5000 students. Short courses, research and consulting activities are also undertaken.

PRINCIPAL LECTURER IN MANAGEMENT

The School of Business and Public Administration offers a wide range of management and related studies and is seeking an academic with industrial experience to provide leadership in the integration and development in this growing area. The appointee will play an active role in the planning and operational activity of the School and provide teaching, research and academic leadership in the management area. He/she will be expected to establish and maintain contact with appropriate groups in both the private and public sectors.

Management courses offered include Bachelor of Business (Personnel Management and Industrial Relations), Graduate Diploma in Management Studies and Graduate Diploma in Human Resource Management (approved for first offering in 1985). Service teaching is provided to some courses in other Schools. The appointee should be qualified to teach in the area of business Strategy and Policy and either Human Resource Management OR Organisational Management Theory. Applicants should ideally possess a post graduate degree, preferably at the Doctorate level, business and/or public administration, leadership experience and tertiary level teaching experience in management.

SENIOR LECTURER/LECTURER IN MARKETING

The appointee will join an existing team of two staff members in the marketing area and will teach internal and external (self-campus) students in the Bachelor of Business degree (which has a major in marketing) and the Graduate Diploma in Marketing. An interest in the areas of Buyer Behaviour and Product Management is required.

Applicants should have appropriate academic qualifications, preferably at the post graduate level, and practical experience in marketing. Evidence of successful teaching experience would be desirable, particularly for an appointment at Senior Lecturer level.

SENIOR LECTURER/LECTURER IN DATA PROCESSING

Appointees will be required to assist in course design and teach both internal and external students in a wide variety of courses. These include the Bachelor of Business (Data Processing major), the Associate Diploma in Data Processing, and the Post Graduate Diploma in Management, Accounting, Local Government and Education.

Areas to be taught include management information systems, data base, data communications, systems analysis and design, office automation and programming languages.

To assist in the teaching the College operates a FACOM M150F computer utilising OSIV/38, Air and Alt software. Terminals connected to the system are available to students on a 24 hour a day basis. There are also many micro-computers available, operating a wide variety of business packages.

Applicants should have appropriate academic qualifications, preferably at the post graduate level, and practical experience in commercial data processing.

Appointments will be made on either a tenured or fixed term basis. The College will provide a competitive salary and benefits package.

An opportunity exists to join, on a fixed or indefinite term basis, a team of relevant accountants teaching undergraduate and post-graduate courses. Preference will be given to applicants whose specialist areas include other Management Accounting or Auditing.

Applicants should possess strong academic and professional qualifications, together with appropriate professional experience.

Further information about these positions is available from the Dean of the School of Business and Public Administration, Mr. D. J. Green. It is hoped that appointees will take up appointments during July 1984.

SALARY will depend on qualifications and experience - Principal Lecturer III \$43,262 p.a., Senior Lecturer I \$43,352-43,655 p.a., Senior Lecturer II \$43,350-44,055 p.a., Lecturer I \$43,350-44,055 p.a., Lecturer II \$43,350-44,055 p.a., Lecturer III \$43,350-44,055 p.a.

Conditions of employment include an attractive superannuation scheme and a specially negotiated bank finance arrangement for building or buying a house. Rates for rent, utilities and family to be paid. Appointments setting out personal data, telephone number, qualifications and experience, accompanied by the names and addresses of three (3) referees should be sent to:

The Registrar (Staff Appointments)
Mitchell College of Advanced Education
Bathurst, N.S.W. 2780, Australia.
Telephone (0683) 31 1022

Equal opportunity in employment is College Policy. Applications close on Friday, 30th March, 1984.

THE EUROPEAN UNIVERSITY INSTITUTE, FLORENCE APPLIED MACROECONOMICS

Invites applications for a CHAIR in the DEPARTMENT OF ECONOMICS. Other things being equal, preference will be given to candidates with experience and interests in the area of

but candidates specialising in other areas of Economics may also apply. Candidates should occupy a comparable position in a University or research institution. The appointment is for three years, renewable, starting from or soon after 1 September, 1984. Applicants should send a full curriculum vitae with a list of all relevant publications, a detailed statement of their research plans and the names of two referees. The applications should be post-marked with a date no later than 31 March, 1984 and sent to: Academic Services, E.U.I., Badia Fiesolana, I-50010 S. Domenico di Fiesole (FI), Italy. Further particulars are available upon request.

Overseas continued

NATIONAL UNIVERSITY OF SINGAPORE
FACULTY OF ACCOUNTANCY & BUSINESS ADMINISTRATION

Applications are invited for teaching appointments ranging from Lectureships to Associate Professorships in the Faculty of Accountancy & Business Administration.

The Faculty of Accountancy & Business Administration prepares students for the degrees of Bachelor of Accountancy and Bachelor of Business Administration. It comprises the School of Accountancy and the School of Management, which are subdivided into the following functional groups:

School of Accountancy
Auditing
Cost and Management Accounting
Financial Accounting
Legal Studies and Taxation
Management Information Systems

School of Management
Business Policy and International Business
Decision Sciences
Finance and Economics
Marketing
Organizational Behaviour

Candidates must possess an appropriate PhD degree, except those applying to the School of Accountancy should possess at least an accredited academic degree, at Master's level, and professionally recognised qualifications.

Successful candidates may be asked to participate in the teaching of MBA courses conducted by the School of Postgraduate Management Studies.

Gross annual emoluments range as follows:

Lecturer \$28,340-\$58,750
Senior Lecturer \$53,220-\$91,010
Associate Professor \$59,730-\$109,820
(STG1=\$3.01 approximately)

The commencing salary will depend on the candidate's qualifications, experience and the level of appointment offered.

Leave and medical benefits are provided. Under the University's Academic Staff Provident Fund Scheme, the staff member and the University are each required to contribute at the present rate of 23% of his salary, the staff member's contribution being subject to a maximum of \$920 a month. The sum standing to the staff member's credit in the Fund may be withdrawn when the staff member leaves Singapore/Malaysia permanently.

Other benefits include: a settling-in allowance of \$51,000 or \$52,000, subsidised housing at rentals ranging from \$5100 to \$2216 a month, and a gratuity of 50% of annual gross salary in any one year.

Application forms and further information on terms of appointment may be obtained from:

The Director
Personnel Department
National University of Singapore
Kent Ridge
Singapore 0511

NUS Overseas Office
5 Chesham Street
London SW1
United Kingdom
Tel: 01-235 4562

(14274)

UNIVERSITY OF NATAL
FACULTY OF ARTS
DURBAN, SOUTH AFRICA

Applications are invited from suitably qualified persons regardless of sex, religion, race or national origin for appointment to the post of:

DIRECTOR,
CONTEMPORARY CULTURAL STUDIES UNIT

to head the newly created teaching and research unit for Contemporary Cultural Studies, assuming appointment on 1 September, 1984, or as soon as possible thereafter.

The post is at a professional level with a salary in the range of:

R25,882-R33,886 per annum

This includes a 12% pensionable allowance

The commencing salary will be dependent on the qualifications and/or experience of the successful applicant. In addition, a service bonus of 93% of one month's salary is payable annually.

The successful candidate would probably not necessarily have a Master's degree in one of the Arts or Social Sciences, and should have a proven record of research and publications in the field of Contemporary Cultural Studies. Teaching experience directly in Contemporary Cultural Studies will be an asset.

Application forms, further particulars of the post and information on pension, medical aid, group insurance, staff bursary, housing, loan and subsidy schemes, long leave conditions and travelling expenses on first appointment are obtainable from the Secretary, South African Universities Office, Chichester House, 278 High Holborn, London WC1V 7HE, or the Registrar, University of Natal, King George V Avenue, Durban 4001. With whom applications, on the prescribed form, must be lodged not later than 18th May, quoting the reference D18/84.

Posts
overseas
Poland

2 Readers/Senior Lecturers in

English Literature

Post 1: Gdanek University

Post 2: University of Lodz

Post 1: to teach 17th-20th century English Literature to Polish students following MA course in English Philology. Post 2: to teach 17th-20th century English Literature, with special emphasis on post-1845 poetry and novels, to Polish students following MA course in English Philology.

Qualifications: Candidates should be British nationals over 28, with a PhD in English Literature and some university teaching experience.

Salary: 14,000-21,000 zloty per month plus a sterling subsidy at the rate of £6,780 pa, paid in Britain.

Benefits: One year local contract guaranteed by the British Council, commencing September 1984, renewable.

Closing date for applications: 18 March, 1984.

Reference: 84 B 50-51 TH

Romania

Lecturer in English

University of Bucharest

Post: To teach English as a Foreign Language at undergraduate and postgraduate level, including conversation classes and some applied linguistics/methodology. Possibility of assistance curriculum development/materials writing for teacher training.

Qualifications: Candidates, preferably single, aged 30-50 should be British nationals with a degree, a one year postgraduate qualification in TEFL and substantial overseas TEFL experience. An MA in Applied Linguistics and some teacher training experience is desirable.

Salary: Local salary minimum 4,000 lei per month. Sterling subsidy at the rate of £8,280 paid in Britain. (£1 = 20.14 lei)

Benefits: Free accommodation, subsidised electricity and heating, superannuation contribution, medical scheme, fares, baggage allowance.

Contract: One year local contract guaranteed by the British Council, commencing September 1984, renewable.

Reference: 84 B 40 TH

For further details and an application form, please write, quoting the post reference number to: Overseas Educational Appointments Department, The British Council, 90-91 Tottenham Court Road, London W1P 0DT.

(14285)

Faculty Members for
MU'TAH UNIVERSITY - JORDAN

Mu'tah University invites applications for the following positions with the following qualifications:

1. Assistant Professor - English

Qualification: PhD (or equivalent). Specialization: English Language and Literature. Three years of relevant university teaching.

2. Assistant Professor - Physics

Qualification: PhD (or equivalent). Specialization: Physics. Five years of relevant university teaching.

3. Assistant Professor - Mechanical Engineering

Qualification: PhD (or equivalent). Specialization: Mechanical Engineering. Five years of relevant university teaching.

4. Assistant Professor - Mathematics

Qualification: PhD (or equivalent). Specialization: Mathematics. Five years of university teaching.

Salary and Benefits: (1 JD = £1.90 approx) from 450-850 JDS depending on post qualification experience. Benefits include social security, health and life insurance and free housing.

Applications, accompanied by cv, must be addressed to: PO Box 5076, Mu'tah Liaison Office, Amman, Jordan.

(14282)

Rhodes University
Grahamstown
South Africa

Applications are invited from suitably qualified candidates, irrespective of race, colour or sex, for the following posts from as early a date as possible:

DIRECTOR OF THE
INSTITUTE OF
SOCIAL AND
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For details and application form please write to:

Anna Lisa Haselden
Director of Special
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International Study Service
37 Queens Gate
London SW7 5HR

(14281)

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Closing date for applications: 14th May 1984. H19

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